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ORIGINAL COMMUNICATIONS.

(Original Communications are received with the understanding that they are contributed exclusively to THE LARYNGOSCOPE.)

1. FURTHER REPORT ON THE TREATMENT OF MALIGNANT DISEASE OF THE LARYNX.*
2. MANAGEMENT AND STATISTICS OF MALIGNANT DISEASE OF THE UPPER RESPIRATORY TRACT.†

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In making this further report on the cancer question as it refers to our specialty and the larynx in particular, I wish to call your attention very briefly to my last report read before this Section last year in St. Louis, and published in THE LARYNGOSCOPE, September, 1916. In that report I stated that we had not yet any specific treatment or cure for this terrible affliction; that the surgical treatment when done thoroughly and immediately after an early diagnosis gave the only chance. I also described other than surgical methods of treatment, such as diathermia, deep penetration Roentgen-ray, and particularly the Percy coagulation method of removing the neoplasm. In the summary of cases treated by these methods I stated that the Roentgen rays aided by the action of the diathermic current caused marked changes and often disappearance of the growth, which later would recur and terminate fatally; that with radium in the dosage of ten mlgrs. pure, which I had at my disposal, no appreciable influence on the growth could be seen, but that the Percy coagulation method promised to do more than the x-rays or radium, as I then employed them.

Since the above I have continued to employ these various methods and have already made a brief report on the Percy coagulation

†Read before the Illinois State Medical Society, Champaign, May, 1917.

*Read before the Middle Section of the American Laryngological, Rhinological and Otological Society, Feb. 26, 1917.

treatment before the Chicago Medical Society this winter, which I will present again in this report, particularly in so far as the larynx is concerned.

I have also added in this report the use of the diathermic current surgically, that is, the mummification of the tissues, and the use of massive doses of radium. On these last two methods of treatment I wish to make only a preliminary report, because not enough time has elapsed to show their value as a permanent cure.

Finally I desire to report on laryngectomy, in one case in particular.

In the discussion of the cancer problems, particularly in the treatment, it has been the attitude of those taking part in the discussion to be very charitable, because all recognize its hopelessness thus far in the advanced cases or deep seated cancers. This attitude would be all right if it were not for one fact, and that is, that the essayist so often oversteps the boundary between enthusiasm and accuracy in making his report, thus promising too much. The result is an influx of cancer cases from physicians as well as from the laity. The disappointment, as a rule, which follows to the doctor who sends the patient, as well as to the family of the patient, and the loss of confidence in subsequent work along this line, is self-evident by the lukewarm action when another report along the line of cancer is made by someone else.

The writer is cognizant of this fact from a recent experience, not along the line of treatment, but in the study of the etiology of cancer. To further illustrate my point of the apparent indifference that the medical profession in general has in the cancer problem, because of the exaggerated statements made by most of the workers, I will very briefly narrate this experience. A laboratory student (Dr. Buchsbaum) of the cancer question was given a fluid to examine, obtained from the interior of an abdominal cancer. The smear showed a torulla. Cultures made from this fluid and subsequently examined showed a rich brick-red colored growth, which was a pure culture of these same torullae or yeast cells. A quantity of these yeast cells were injected into mice and as a result there developed tumors which when examined by microscope showed all the evidences of epithelial cancer and invariably resulted in the rapid death of the animals. From these tumors in the animals the same growths of torullae were again obtained and when these were re-inoculated into mice, they produced the same growth, namely, an epithelial mass. A great deal more detail work was done by Dr. Buschsbaum, as well as by Drs. Carl and Emil Beck, and myself,

who aided and co-operated with him from the surgical and clinical side, in order to assist in possibly adding even a mite to this hopeless condition of cancer.

He made his report before the Chicago Pathological Society after nearly three years of labor, and his efforts were received with little favor or perhaps I might say with indifference. Desirous of having his work published in recognized journals devoting their pages to strictly scientific subjects, particularly on the cancer problem, he asked for that privilege of the editors of said journals. What was the result? After reviewing his work and reading his manuscript it was returned with an indefinite statement, saying that it was not a paper they could accept. Is that not an indifference and a sad commentary on our American journals?

An example of credulity is the following: A surgeon reports before the Chicago Medical Society on the value of bacterial enzyme injections in cases of cancer of the abdominal cavity, with cures. He cites a case of retroperitoneal tumor, supposed to be sarcoma of considerable size, that was treated with injections of these enzymes and cured. There was no microscopical examination made; the father of the patient being a prominent surgeon, happy in the results, discusses the case at this meeting and accepts the fact that because the tumor disappeared the injections cured the sarcoma. Is that not credulity in the extreme? And to think that there was no dissension from these extravagant claims in the discussion that followed! The same is true of reports of other methods of treatment of cancer, such as x-ray, radium, mesothorium, diathermia and all sorts of injections of sera, solution of chemicals and what not.

In compiling the reports of the many methods employed outside of surgery in cases of cancer for the past twenty years, or since the advent of the x-ray as a therapeutic measure, I found not a single well founded and authentic report of a cure of a cancer by such methods, although many beneficial results and improvements were cited. My personal results from experimentation with autolytic solution injections as well as with radium, deep x-ray and diathermia therapy in carcinoma, have been of no permanent value. Surgery, which up to date is the only means of combating the disease, is too often defeated of a cure by recurrence, and here also frequently too early reports of cures are misleading; that is to say, the cases are not followed up long enough. The recent organization of the society for the Prevention and Cure of Cancer has a wonderful opportunity in regard to the many problems that come up in the

subject of cancer, and the control of these reports is not the least important.

The reasons why surgery is so often defeated may be stated as follows:

(1) The patients present themselves too late for us to make an early diagnosis.

(2) Failure to make an early diagnosis.

(3) Timidity in operating extensively, especially in the removal of the tributary glands.

(4) Implantation carcinoma along the field of operation.

All four of these reasons are more easily overcome in cancer of the larynx, because the earliest devolpment of a neoplasm is called to the attention of the patient as well as of the doctor by (a) hoarseness in an older individual, particularly in men, that does not disappear with or without treatment within two or three weeks. This should be looked upon with suspicion and carefully watched and examined for cancer. Not that every hoarseness that lasts that length of time proves to be cancer, but it must be ruled out. (b) This hoarseness brings the patient early enough for an early diagnosis. (c) Cancer of the larynx is usually found in the anterior portion of the cords, and from this region the lymphatic distribution is very small and secondary glandular involvement is a long time in developing. As Crile has so aptly stated, "It is a cancer within its box," consequently the second and third reasons do not apply. Early diagnosis and no very extensive surgery is necessary, that is, no dissection of tributary glands. (d) Of course the removal of the larynx, which is the only means known to-day of positively insuring against implantation recurrence, is an extensive, and to the patient, a most depressing operation, because patients believe that they will not be able to speak except with a buccal sound. Laryngectomy is also associated with considerable risk to the patient's life from complications such as shock, pneumonia and mediastinitis.

In order to overcome some of these great objections to the complete removal of the larynx as well as recurrence due to implantation, I have developed the technic of laryngeal fissure and removal of the neoplasm by means of the Percy coagulation method.

1. *Percy Coagulation Method.* This method of treatment was first recommended by Percy for inoperable uterine cancers, but subsequently also for operable cancers of the uterus as well as other parts of the body. I have employed the method for cancer of the

nose (carcinomas and sarcomas), carcinoma of the upper jaw, lower jaw, thyroid gland, external ear and larynx, in twenty-three cases, as follows:

Sarcoma, intranasal, 1 case.

Carcinoma, extranasal, 1 case.

Carcinoma of the upper jaw, 7 cases.

Carcinoma of the upper and lower jaw, 2 cases.

Carcinoma of the naso-, oro- and hypopharynx, 1 case.

Carcinoma of the lips, 2 cases.

Carcinoma of the thyroid gland, 1 case.

Carcinoma of the external ear, 1 case.

Carcinoma of the tongue, 3 cases.

Carcinoma of the larynx, 4 cases.

It is not my purpose to go into the philosophy of the Percy coaglation method, because the detailed description may be found in several of the articles written by Dr. Percy and published in the *Journal of the A. M. A.* in the past three years, nor do I wish to describe in detail all the cases treated by me. All I wish to say is, that it is a slow method of destroying the carcinoma or sarcoma *in situ* by a sort of cooking of the tissues and subsequent sloughing or discharge. The ultimate cicatricial formation and tenacity of the necrotic mass are the objectionable features that I have found. As to complications which have been reported, I have observed none. I have had one case of laryngeal carcinoma in which a large thyroid gland was present, which was in the way and had to be partially resected and many ligatures applied. A hemorrhage took place on the tenth day, most probably from a sloughing of part of the gland. This hemorrhage rapidly filled up the patient's lungs and choked her before help could be summoned.

The reasons for substituting a laryngotomy and removal of the growth by the Percy method for a laryngectomy are:

(1) The patient will consent more readily to an operation when he may be promised that he may have a voice, even though it will not be normal.

(2) He may even hope to have a normal breathing tube, and not have to wear a permanent tracheotomy tube.

(3) The operation is not as dangerous as a laryngectomy.

The real value of the Percy coagulation method of treating cancer of the larynx will be further brought out in the case reports that follow.

2. Diathermia Coagulation Method. Nagelschmidt in his textbook which appeared about four years ago has given the technic of the surgical dealings with malignant disease by the use of the diathermia coagulation method of treatment.

The principles underlying this treatment are the passing of a high frequency current from one pole to the other, between which there is a portion of the tissue to be penetrated by this current. Usually about one centimeter of tissue is treated at a time. The radiation passes from a pointed electrode to a flat one, thus causing a conical destruction.

It is necessary to anesthetize the patient either by general anesthesia or by the use of novocain infiltration, because the treatment is very painful. A quantity of electricity, from 800 to 1800 milliamperes, is passed through, when there is a sizzling noise and one observes a vapor escaping from the tissue thus treated. Sometimes, when the height of the degree of charge has been reached, an arc forms about the electrodes, which is evidenced by a sharp report spark.

I have measured the degree of heat of the tissue after the treatment and have found that it varies from 110 to 130 degrees immediately after the current is turned off. A number of points are thus attacked at a time and the interval between the treatments depends entirely upon the affect of the pain on the patient. We have usually applied this treatment every other day.

The resultant destruction can be seen in the Figures 1 to 7 of the case reported, during a period of six weeks.

At no time is there any evidence of an odor as from a slough in other types of necrosis.

Another important factor is the control of bleeding by this method. The strangest observation that I have made is, that in spite of the marked destruction and excessive heat produced, the internal carotid artery, jugular vein and the facial nerves which were in close proximity to the region thus treated have not suffered loss of their function.

3. Deep X-ray Penetration. As far as the deep penetration x-rays are concerned we have practically discontinued their use in carcinoma of the larynx, owing to the fact that the one case of carcinoma of the larynx which I was banking on as cured of its intrinsic growth by this deep x-ray treatment, after two years came to laryngectomy and showed the futility of this kind of treatment. Quite different is this type of x-ray treatment as far as sarcoma is concerned. Here the value of this treatment can scarcely be esti-

mated. While I have only one case of sarcoma of the larynx to report, in which deep penetrating x-ray has been employed with apparent success, I have several cases of maxillary, postnasal and pharyngeal sarcoma which responded remarkably. (Note concluding remarks in discussions.)

4. Massive Doses of Radium. Recently we have made use of massive doses of radium in malignant disease of the upper respiratory tract and in one case of sarcoma of the larynx. The amount employed was 125 mlgrs. pure radium for a period of 36 hours, rented from the Physicians' Radium Association, Chicago. What the ultimate result will be in this case I am not in a position to say because it has been employed too recently, but thus far I have seen a marked reduction of the growth.

5. Laryngectomy. Before this Section in Detroit, February, 1914, I made a report on this subject, having operated on eleven cases at that time. Since then I have not done a laryngectomy, principally owing to the high mortality rate and loss of voice, until very recently, and to that case I have already referred in my reference to the failure of deep penetrating x-rays. (This case is described later in detail.) I satisfied myself with less radical measures such as described above. As regards the value of the less radical surgical measures, that is, laryngotomy and excision, I still have two cases, one four years and the other nine years since operation, that have not had any recurrence. That, of course, is a small percentage compared to the fatalities from such a procedure.

Laryngectomy so far as the patient is concerned is much dreaded owing to the loss of the voice, and if an artificial larynx or means could be established where a substitute for the normal voice, even though it be imperfect, could be promised, this serious objection would be greatly overcome. To this end I have recently been working and believe that I have succeeded in modifying the usual technic of laryngectomy so as to enable me to place such an artificial means from the trachea to the mouth, which promises to give satisfaction. This, too, I will describe in detail in connection with the case report.

Management and Statistics of Malignant Disease of the Upper Respiratory Tract.

Ordinarily speaking, the management of malignant diseases of the upper respiratory tract would refer to the two conditions, namely, sarcoma and carcinoma, but in a stricter sense of the word it refers to any pathological condition that progresses towards a fatal

termination in spite of treatment, usually spreading rapidly. Such other conditions as endothelioma—endovascularis, angioma progrediens fulminantes, chloroma, cholesteatomata, malignant syphilis, scleroma, actinomycosis and tuberculosis must be considered as malignant diseases at times.

It is impossible, even in the briefest manner, to describe each of these conditions in the time allotted to this presentation, nor was it my purpose to do so were the time unlimited. I wish to give a resumé of my own experience with sarcoma and carcinoma about the head and neck, with particular reference to the final or end results. That word final, in this last sentence, could easily be replaced by fatal, because it is well known to all of you that in so far as the carcinomas of the nose, mouth and throat are concerned, they invariably terminate fatally, no matter what form of treatment is employed. In spite of these discouraging facts the medical profession is putting forth its untiring efforts to change those conditions. Therefore, speaking specifically to the subject of management, we should consider certain factors, which, however, are subject to differences of opinion, as the basis of a possible discussion.

First. All who are interested in the subject of cancer should become members and co-workers in the society organized for that purpose, namely, The American Society for the Control of Cancer. All matters pertaining particularly to the education of the public in the possibility of prevention of this malady as well as the early recognition both by the laity and the general practioner are its most important duties. The censoring of case reports, as well as the control of the scientific journals of laboratory work of cancer is no small part of its duty. Finally the treatment of cancer.

Second. The earliest possible diagnosis is to be followed immediately by the most radical intervention. This does not always mean surgery.

Third. All points of irritation, such as fissures, chronic inflammation, stones, non-malignant growths, foreign bodies and jagged edges, are to be looked upon as precancerous states, and should be corrected.

Fourth. When a malignant growth has assumed the proportions of a metastatic growth or involved the neighboring tissues to such extent as to make life unbearable, were the cancer removed, then in such a case palliative treatment is indicated and the limit of that wonderful remedy, morphine, should be given so as not to have the patient suffer any pain.

Fifth. However, should the growth be ever so large and so completely involve the neighboring structure as to probably leave a large defect in appearance as well as function, and furthermore, should the procedure appear to be so formidable as to offer only a small chance of a permanent cure from the cancer, it is our duty, I believe, to give such patients that chance and operate. I claim that one case in one hundred that will recover following such heroic measures is one hundred per cent of cures, because without that procedure the patient would succumb to the disease.

Sixth. In the removal of particles of tissue for microscopical examination, it must be borne in mind that cutting into a malignant growth will frequently aggravate the process or endanger the healthy neighboring regions from implantation of cancer cells. Consequently Dr. Bloodgood has recently recommended the use of an electrically heated knife which will prevent that difficulty and yet not spoil the tissue for correct microscopical diagnosis.

Seventh. The follow-up system of cancer cases is of the utmost importance and the co-operation of the medical profession in making this of practical value is absolutely essential. The word cure of a case of cancer in a report should be well fortified by all the scientific proofs of a diagnosis as well as the time limit. It must be remembered that there are early and late recurrences. The accepted time limit of malignant disease of the upper respiratory tract, including the mouth, is five years.

Statistics. The number of cases observed and treated by me, and of which I have complete reports, including the follow-up system in the majority, since 1895, are 143.

I have, without a doubt, seen again as many cases in clinical, dispensary and charity hospitals, as well as in consultation, of which I have no records, consequently of no value statistically. Suffice it to say that some of the sarcoma patients lived, while almost all carcinoma patients died.

I will divide them primarily into:

(a) Sarcoma.

(b) Carcinoma, without any reference to the type as to the cellular pathological entities.

SARCOMA.

External Nose. Two cases, both terminated fatally, although one case lived five years, during which period four operations were performed.

Intranasal, including the sinuses, eleven cases; all operated upon; eight followed up to a very recent date; five of these eight cases have now some sarcomatous tissue present, three are cured.

Nasopharyngeal. Nineteen cases, all operated upon. Seven followed up to a very recent date. Four died between the third day following the operation and the second year after. Eight cases not possible to locate.

Tonsillo-pharyngeal. Three cases, all died; one operated on and died six weeks after. The other two grew so rapidly that death ensued within a month.

Alveolar-palatal. Two cases. Both alive and apparently cured. One operated on four times, the other treated by massive radium.

Mandibular. Two cases, both died in spite of radical operation, although surviving these for several months.

Lingual. One case, alive, apparently cured by operation.

Laryngeal. One case, still alive and under treatment by massive doses of radium, having been operated on four times previously.

SUMMARY—

Total number of sarcoma, 41.

Total number accounted for at recent date, 30.

Total number of deaths, 11.

CARCINOMA.

External Nose. Epithelioma. Twelve cases, ten operated upon, two treated. All followed up to recent date. All lived without recurrence. Five died (from intercurrent diseases several years after treatment; no post-mortem having been obtained in any of them).

Intranasal, including the accessory sinuses. Seven cases, three operated upon, five followed up to recent date. All dead.

Alveolo-palato-pharyngeal. Thirty-nine cases; eighteen operated upon. Twenty-four followed up to recent date. Two alive, one eight years and the other three years since operation. The remaining twenty-two cases are dead.

Lingual. Seven cases; four operated upon, six followed up to recent date. One still alive, now three and one-half years since operation. The remaining five cases are dead.

Laryngeal. Thirty-seven cases, thirty-four operated upon, twenty-six followed up to recent date. Of these five are still alive and apparently without any recurrence. The procedures were three laryngectomies, eight years, five years and three months since operation; one laryngeal fissure, five years since operation, one by indirect laryngoscopy, now eleven and one-half years since operation. The remaining twenty-one cases are all dead.

SUMMARY—

Total number of carcinoma cases, 102.

Total number followed up to recent date, 73.

Total number still alive, 21.

Total number dead, 52.

In conclusion I wish to report four cases of malignancy of the larynx. I would further say that in so far as the management of the malignant conditions outside of the sarcoma and carcinoma that are mentioned above there appears to be nothing gained by surgery. Deep x-ray, massive doses of radium, high voltage of diathermia, Finsen rays, sun rays and salvarsan all have some influence.

CASE REPORTS.

Case 1. Mr. R., 54 years old, married, three children, many years a waiter and in the saloon business. Has always been well, except for hoarseness, until eight months before presenting himself, when he noted considerable more hoarseness from which he never recovered, in spite of treatment by specialists. He had received thorough antiluetic treatment on general principles and as a therapeutic test, without any results. This hoarseness soon developed into a marked type, with some embarrassment in respiration. He had lost in weight, but had no pain upon swallowing.

Examination. Somewhat emaciated looking man, but bodily examination shows him to be fairly muscular and to have plenty of fat. The physical examination was negative. Blood examination showed a two plus Wassermann, but the Abderhalden was negative as to carcinoma. Sputum negative as to tuberculosis.

Nose. Indicative of a sinus trouble or atrophic rhinitis.

Larynx. Considerable difficulty in inspiration, making quite a marked noise, and very hoarse voice. Inspection revealed a thickening of both cords, particularly the left. It appeared as though there might be considerable thickening subglottically. The diagnosis pointed to a luetic condition with a possibility of a rhinoscleroma. I determined to do a suspension laryngoscopy in order to examine below the cords and also take out a little bit of tissue for microscopical examination. While doing this suspension or following the action of the cocain locally, the patient became suddenly very short of breath and cyanotic, so that I was compelled to do a hurried tracheotomy. That was all the treatment for about two weeks. He had now recovered, in fact, gained some in weight. It was now possible to make this suspension and remove the tissue. There was considerable thickening below the cords and the removal of a bit of this tissue showed it subsequently under the microscope to be a squamous-celled carcinoma. One week later a laryngotomy was performed and the growth removed from within the larynx

in the following manner: Under ether anesthesia through the tracheal canula, an incision was made with the ordinary instrument down to the thyroid cartilage. The parts were widely retracted. By means of the Percy cautery the thyroid cartilage was seared in the median line. An incision was made through the cartilage with Jackson's scissors. The thyroid cartilage was now split and widely retracted. By means of Percy's small knife the entire intralaryngeal mass was cooked without any cooling externally, or within the esophagus. This was accomplished by periodically lying the heated point against the tissue and waiting until one heard a sort of a

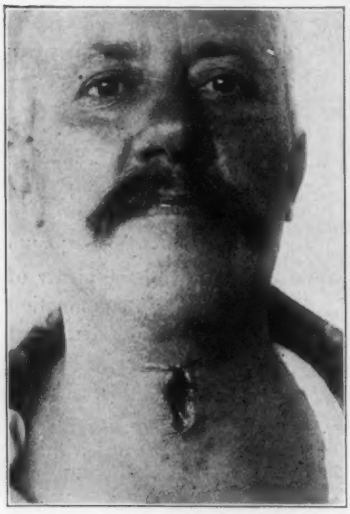

Fig. 1.

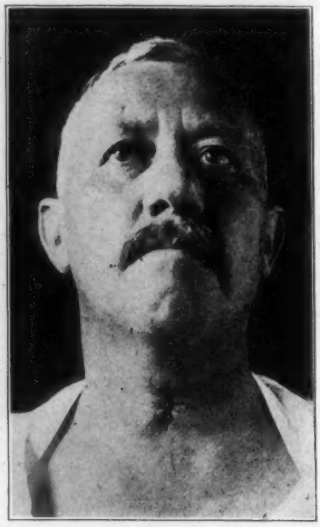

Fig. 2.

hissing sound, but never permitting the tissues to become charred or burned. This procedure required about thirty minutes. It was found that some of this thickened tissue appeared to go down into the cricoid region, so I concluded to communicate the tracheal opening with the laryngotomy, also by the aid of the Percy knife. The interior of the cricoid and tracheal region was similarly treated by the Percy heated point as above. An up and down Jackson tube was now put in and the larynx dressed wide open to promote the throwing off of the slough. The patient had not much of a reaction; in less than two weeks he was fairly clean. At the end of one month the tube was left out and the wound allowed to close.

For about three weeks the patient breathed well and had a very fair voice, then he began to show evidences of breathing with some difficulty, and at the end of two weeks the larynx had to be reopened, which was very easy, and a tracheotomy tube inserted. It was decided to wait, to ascertain if there was going to be any recurrence before attempting further treatment and to establish normal breathing through the larynx. After about six weeks' observation, showing no evidence of recurrence, I decided to employ an intubation tube, which has given me excellent service in treatment of laryngeal strictures from other causes. A piece of tissue removed for microscopic examination proved again to be negative. This tube was

Fig. 3.

Fig. 4.

allowed to remain for about two weeks, when the patient showed some evidences of pain in swallowing. On removing this tube I found that it had produced a decubital ulcer on the lower posterior wall of the trachea. The result from this intubation was very satisfactory, but the laryngotomy wound was kept open nevertheless by means of sounds, in order to observe any recurrences.

Conclusions in this case in October, 1916, were:

1. That the patient is possibly cured of carcinoma of the larynx.

2. That the Percy treatment without the cooling apparatus produces greater cicatrization than when it is employed with the cooling apparatus, as will be shown in a subsequent case.

3. That there may be an element of lues in the case, that is to say, both diseases may be present.

4. That tubes should not be left *in situ* without examining for possible decubitus ulcerations from pressure.

The result from this mode of dilatation is, however, not promising in this case, because, after a few moments, the laryngeal opening closes down and the tracheotomy tube must be again inserted. It is my opinion that the patient will have to wear an up and down tube or an intubation tube for a much longer period and if after that it will not remain open, then he will have to wear a permanent tracheotomy tube. In that event he would be given one that he could close by the aid of the shuttle, operated from his pocket.

Fig. 5.

Subsequent course. About one week after the above date (Nov. 16, 1916) the patient showed evidences of great difficulty in swallowing and marked symptoms of septicemia. On exploration I found the posterior laryngotracheal surface in a state of coagulation necrosis. A day or two later the patient showed evidences of a fistula between the esophagus and the trachea, in the midst of this necrotic tissue, so that he was put on rectal feeding. It was soon found that he could not subsist long on this method of feeding, so I advised a gastrotomy, which was performed, under local anesthesia, by Dr. Carl Beck. The patient stood this ordeal very well, but could not retain much of the food poured into his stomach; he would vomit or return it through the created gastric fistula. About one week later, while his neck wound was being dressed there came away a large slough which left a perfectly smooth cavity or outline of the thyroid cartilages, with the opening of the esophagus, but

no evidence of any carcinoma. Tissues taken at different times from the neck region for microscopic examination showed at no time evidences of carcinoma. It now became possible to insert a stomach tube into this esophageal opening and so feed the patient, allowing the gastric fistula to close. The patient, however, was so markedly weakened that it did no good and he succumbed to the general anesthesia. This case demonstrates that the coagulation method destroyed all the carcinoma, but at the sacrifice of life. It reminds me of a story which is *à propos*, hence I hope to be pardoned when I insert it in this paper.

Fig. 6.

"A man that had a cancer of his face was asked by a patent medicine company for a testimonial, because it was known that he was cured by their product. He acquiesced and said: 'After taking ten bottles of your medicine I wish to say that I am glad to state that the cancer of my face is gone, but I am sorry to say also that my face is gone too.'"

The loss of this man's larynx may be due to the fact that the principles of Percy's coagulation method were not carried out in the strictest sense, because I had to develop my own technic. I have reference to the cooling of the neighboring tissues, which it will be seen was employed in the subsequent cases with not such destructive results.

Case 2. Mr. Hgl., 55 years old. Married, two healthy children. Brewer by trade, uses his voice often in speech making, and in

summer is a great rooter at the baseball games. Lives in Montana in the copper smelting region.

For past six months the patient noted a hoarseness which gradually increased to a marked degree. He consulted his specialist, who told him he had a growth in the larynx and removed a piece for microscopical examination. This proved positive for carcinoma. With this history he was referred to me. I found a growth as large as a hazel nut, irregular in outline and situated nearer the left posterior commissure than the anterior. The physical and laboratory examination, other than the microscopic examination of the piece removed, were negative. Operation was decided upon. Under local anesthesia (morphin ¼ gr., and novocain and cocain) a laryn-

Fig. 7.

gotomy was performed, the same way as in Case 1, except that no preliminary tracheotomy was done, and the cricoid cartilage was opened. The same procedure of removing the growth and cooking its base as in the previous case was done by the Percy method, and no cooling device employed. It must be remembered that the growth was located nearer the esophagus than in Case 1, owing to what followed. The thyrotomy was dressed open by packing on top of an up and down tube. The patient made a very rapid recovery but he could not swallow. After the customary forty-eight hours he had to be fed by rectum for more than a week. At the end of that time it was possible to pass a stomach tube and he was fed through that, but still it was impossible for him to swallow, although local conditions appeared very satisfactory. At the end of the third week he could not swallow water, but he could swallow

rice and mush. At the end of five weeks he could swallow anything. The tube was left out and the wound permitted to heal.

The patient went home to Montana, and I heard nothing from him until four months later, when he came in with a tracheotomy tube and marked swelling on the right side of his neck. He stated that he had been feeling fine, constantly gained in weight, when one day he noted a pain in swallowing, then a sudden appearance of a swelling on the other side of his neck, chill and fever and considerable difficulty in breathing. The doctor was called in and hurriedly took him to a hospital, where he performed a tracheotomy. This neck growth then disappeared somewhat slowly, but again

Fig. 8.

reappeared, then began to decrease, but now he cannot breath well when the tube is taken out.

Examination shows that the man has not lost any in weight and within the larynx there does not appear to be a recurrence of carcinoma. There was, however, a sort of an edematous tissue about the right cord, closing up the larynx. No motion to the arytenoids. The neck mass is not nodular, but smooth, hard and yet appears to fluctuate somewhat. Slight temperature every afternoon. My diagnosis was a possible pharyngo-esophageal diverticulum in consequence of the weakening of the wall, due to the action of the Percy heater. I therefore cut down the swelling and found a great deal of infiltration of the tissues of the neck. I removed some of this infiltrated mass and had it examined microscopically (it was found negative as to cancer). Coming down near the pharyngeal area I

opened into a cavity which was filled with a considerable amount of thick fluid containing white particles, which were found microscopically to be necrotic tissue. A drainage tube was inserted and the patient observed as to possible recurrence of the carcinoma.

Conclusions in this case are:

1. That the patient is possibly cured of his carcinoma of the larynx.

2. That the location of the growth near the esophagus and the removal and subsequent cooking of this carcinomatous base without any cooling apparatus was probably responsible for the weakening of the esophageal wall with subsequent wall diverticulum formation.

Fig. 9.

Fig. 10.

3. That had the doctor incised the swelling and put in a drain he might have avoided a tracheotomy.

Subsequent course. Within a few days another piece of tissue removed from the neck mass showed a rapidly growing carcinoma. There was very likely a glandular infection present at the time of the first operation, but it could not be determined, as the patient had a very short, fat neck. I now decided to try out the method of coagulation by the diathermic process, which I wish now to demonstrate. We inserted into the tumor the flat metal electrode and the sharp needle point electrode opposite this flat surface, having about 1 cm. of tumor mass between the two electrodes. The cur-

rent was now turned on and from 1000 to 1800 milliamperes of electricity sent through. One observed the sizzling of the tissue and if the finger was put on, one would feel that the tissues were very warm. The measurment of the heat by a thermometer registered 120° F. about one minute after the treatment.

Such applications are made in three or five places at the same seance. Of course, the skin and tumor are injected with novocain because the treatment is painful. After six weeks of treatment once or twice a week, we found a considerable degree of reduction in the size of the tumor. It was not exactly a necrosis but a mumification

Fig. 11.

Fig. 12.

of the mass and falling off with the dressings. There is comparatively little odor to the wound unless neglected to be dressed. It is interesting to note the resistance of nerves and blood vessels to this treatment. The facial nerve is almost exposed and the heat from the treatment must undoubtedly reach the nerve, yet the facial muscles are in perfect action. The carotid artery is exposed and fearing possible erosion and fatal hemorrhage, I decided to put a ligature about it at the innominate, thus being able to tie it in event of an accident.

A few days later a sharp oozing occurred, so I decided to ligate the carotid. This however did no good, because the following day a much more severe hemorrhage occurred, from which the patient succumbed.

Post-mortem examination of the wound showed that the hemorrhage came from the internal jugular, which I considered thrombosed a long time before this.

The further conclusions in this case are that the carcinoma was not destroyed by the diathermia as we applied it, and that neither nerves nor blood vessels are easily affected by the degree of heat obtained by this strong current. The progress of the disease and treatment is illustrated in figures from 1 to 7.

Case 3. Mr. Frtch., 51 years old, began to notice hoarseness in June, 1916. After about three weeks he consulted a laryngologist, who treated his throat by local applications. On one occasion following a treatment he had a choking spell that alarmed the family. He was also rapidly developing difficulty in breathing, particularly

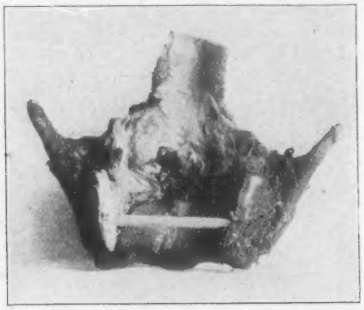

Fig. 13.

on inspiration. He consulted another laryngologist, who recognized a growth and suspected carcinoma.

At this stage the patient was referred to me, exactly seven weeks from the time he started to complain of hoarseness. On examination I found a pale looking mass the size and shape of a good-sized hazel nut, attached on the right side at and below the vocal cord near the arytenoid region. It was smooth in character and appeared to be quite free and movable, like a polyp. General condition of the patient was excellent. Operation for relief and positive diagnosis decided upon. This was performed at once, under local application to the oral cavity, pharynx and larynx, of pure cocain by suspension laryngoscopy.

While doing this the patient gave a sudden marked inspiration and sucked in the pedunculated tumor into the cavity of the larynx, completely shutting off his air. By means of a long pair of dressing

forceps the tumor was brought back outside of the larynx so that the patient could breathe again. By means of Killian's alligator forceps the pedicle of this tumor was grasped and without very much effort the whole growth was removed. Very little bleeding followed. The base of this growth remaining in the larynx was now thoroughly curetted and the Percy cautery applied.

There was very little reaction following this procedure and the patient considered himself cured. The microscopic examination of the tumor removed proved it to be a small spindle-celled sarcoma with very few blood vessels and blood lakes. It was decided to do a more radical operation should there be a recurrence. This

Fig. 14.

occurred with such rapidity that within ten days the patient had difficulty in breathing. A laryngotomy by the aid of the Percy (cold iron) coagulation method was performed and the tumor removed. I employed the esophagus cooling tube as well as the Leiters coils externally, thus conforming nearer the true technic of Percy. I closed the laryngeal wound primarily, but left in the tracheotomy tube for a few days. There was considerable toxic absorption from the wound, but the patient made an uneventful recovery and left for his home town three weeks after operation, with the tracheal opening closed. Two weeks later the patient began to show evidences of laryngeal obstruction and the laryngologist in his home city advised him to return to me because he found a rapid recurrence of the growth.

The patient wished to defer doing this a few days, when one day he had a choking spell and the doctor had to do a hurried tracheotomy. As soon as he recovered from the shock, etc., of the last procedure he came back under my care. I found a smooth growth filling up the entire larynx and in the centre a yellowish, firm, necrotic plug. I decided to reopen the larynx and found the entire ventricle filled, principally with this necrotic plug, which could not be dislodged. The microscopic examination of a piece of tissue removed still showed sarcoma. It was now decided to give him x-ray treatment by means of deep penetrating rays, right through the laryngeal fissure which was being held open by a Jackson up and down tube. The patient was now beginning to show marked symptoms of toxic absorption and it was thought best to discontinue the x-rays and try massive doses of radium. Therefore in January, 1917, the various shaped tubes and applicators of radium were placed within and without the larynx and allowed to remain twelve hours at a time, for thirty-six hours. Altogether 200 mlgrs. of pure radium was used at each sitting. The immediate result, that is, within a day or two, was striking. The odor and what little pain there was became much less. On the sixth day we could see a decided shrinking of the sarcomatous mass, but the existing necrotic plug from the Percy treatment did not appear to be influenced, except perhaps that the toxic absorption from it was less.

Subsequent course. During the next three weeks the sarcomatous mass was seen to be shrinking, the neighboring skin of the neck much reddened and tender to superficial touch. Even the necrotic plug became loosened up, but whether that was due to the action of the radium or was about due to come off is problematical. The fact remains that thus far, three weeks after the radium has been applied, he is in a better condition than he was before the first operation. He is gaining in weight and is very hopeful of a cure. It is, of course, my intention to make a subsequent report of this case.

The progress of the disease and treatment up to date of this paper are shown in figures from 8 to 11.

(Note)—Since the presentation of this paper in February, 1917, the patient shortly after began to show evidences of marked toxic absorption, also rapid emaciation and evidences of increase in the necrotic mass. He began to have great difficulty in swallowing, with marked infiltration of the esophagotracheal region, which led to a speedy end.

The final conclusions in this case are that neither the operation, Percy cautery, nor the x-rays and radium were able to stop the growth of the sarcoma. While the necrotic mass following the application of the radium and the result of the original burning with the Percy cautery showed evidences of destruction, there appeared to be definitely outlined a new growth of sarcomatous tissue. Another important point is that in the future when I make a diagnosis of this condition of sarcoma of the larynx, I shall insist that a laryngectomy be the only procedure warranted.

Case 4. Mr. M. This case has already been reported in the *Annals of Otology, Rhinology and Laryngology,* March, 1917, as a probably cured case of carcinoma of the larynx by means of operation by suspension and deep penetrating x-ray treatments. I will, however, make an abstract of that report in this connection, since it will save time and be more complete.

Patient, age 54, always in good health, slight hoarseness of three years' standing. Consulted laryngologist, who found a small node anteriorly on the left cord. Removed a particle, which was sectioned and diagnosed by competent pathologists as a squamous-celled carcinoma. This the patient brought to me with the suggestion from his laryngologist to remove the larynx if it were the only thing to do, but to try and save the voice if possible. The laryngoscopic examination verified the previously stated picture and it was decided to do a thyrotomy, but to subject the patient to a preliminary deep x-ray treatment to possibly prevent implantation and for sealing up of the lymphatics. The result from the x-rays (ten treatments) was remarkable in the reduction of the swelling and clearing of the voice. I now decided to change my plan and therefore suspended the patient and removed all the growth I could find. This proved to be microscopically, carcinomatous. I had him x-rayed again for three erythema doses, twenty-six treatments in all, in the hope of completely eradicating the disease. He did splendidly in so far as the action and appearance of the larynx were concerned. There developed, however, a complication from the x-ray treatment that was somewhat alarming, namely, symptoms of myxedema. These promptly disappeared on the administration of thyroid gland. The patient went back to the coast apparently a cured man. After nearly a year he returned, saying that the doctor thought there was a recurrence, and that his voice was not clear. Examination verified these facts. I again suspended him and removed some small particles from the left vocal cord, anteriorly, which showed, microscopically, not to be malignant. He received, nevertheless, another

course of x-ray treatment and returned home apparently cured. Almost another year passed when he wrote to me saying there was a return of the trouble and I advised him to come back. Examination now revealed a considerable swelling at the seat of the old trouble, but it appeared to be smooth. I again suspended him and removed some of this swelling and subjected it to the microscope. The report was normal cells, principally inflammatory. I now treated him locally, with astringents, but instead of getting smaller, the growth grew somewhat rapidly and appeared cancerous. After a number of x-ray treatments were given and no improvement was seen, it was decided to operate more radically. Since the results from the thyrotomy with subsequent Percy coagulation treatment proved not to be successful in my hands, I proposed a laryngectomy, which the patient accepted reluctantly, on account of the prospects of losing his voice. After promising and describing to him my idea of an artificial larynx, and the good prognosis for life if he were operated before the cancer developed outside of the larynx, the patient consented. Under local anesthesia, apothesin one-half per cent solution, and novocain one per cent solution, the following technic was employed:

A T-shaped incision was made, the horizontal incision passing above the hyoid bone and the vertical from the middle of the horizontal incision down to within an inch of the sternal notch. Severing the sternohyoid and the sternothyroid muscles about their middle, dissecting freely the trachea from the two lobes of the thyroid gland, I packed strips of gauze all around so as to wall off the mediastinum. After very carefully dissecting the trachea from the anterior wall of the esophagus, I severed the trachea from the larynx and turned it down toward the sternal notch, allowing it to protrude somewhat. It was stitched to the skin on either side. The larynx was now dissected upwards away from the esophagus until the pharynx was reached. Then the thyrohyoid membrane was severed and the larynx removed, closed with sufficiently healthy tissue to insure that none of the malignant growth was left behind. The defect in the pharynx was reduced to a minimum and the incision united except in the center just below the hyoid bone, which is to become the subsequent place for the insertion of the artificial larynx. Considerable catgut was employed in the obliteration of the cavity. This became infected and there resulted a great deal of sloughing. In order to keep the food from coming out through the pharyngeal opening, it was necessary to feed the patient with a stomach tube. Gradually, as this opening contracted, the patient

could swallow without difficulty. Outside of this trouble, an uneventful recovery resulted, as shown in Fig. 12.

The gross specimen, Fig. 13, when opened showed that the carcinomatous process was confined entirely within the larynx, but markedly involved the base of the epiglottis. A microscopical examination of this growth from the depths shows positive carcinoma. The next step was to construct an artificial larynx. The development and evolution of it would be very interesting to narrate, but since the same is not yet perfected, I will defer the detailed description for some future publication. Suffice it to say that a fairly stiff rubber tube was found to be the best material. It is about two and one-half inches long by one-half inch in diameter. The upper end opening has a sort of a nipple in order to confine it to the opening in the pharynx, while the lower tracheal end is smooth and can move up and down according to the motion of the head and neck. It, however, fits fairly tight so as not to permit any escape of air while speaking. By means of this simple device (Fig. 14) the patient can whisper very well and can be clearly understood. Since it is covered by the patient wearing a handkerchief or band about the neck, most people think that the patient has a cold. The method of producing tone is now being experimented with on this patient. I have applied a means of compressing this rubber tube from the outside, thus narrowing its calibre at one place, making a sort of a chink, and he is able to produce a sound. A couple of elastic bands worked right into the rubber tube, as has been suggested to me by Dr. Iglauer, is also a possibility. Whenever the patient eats, he is compelled to remove this speaking device, but I believe that that objection will also be overcome in time, in that the patient will be able to get the head in such a position that nothing will pass into the tube. He is able to do it now at times.

In conclusion, I wish to say that this patient has all the rights to expect a complete cure from the cancer, but a subsequent report will be necessary. If, when this patient succumbs, from no matter what cause, outside of cancer, he is not thoroughly examined postmortem, we will not know whether he was cured or not.

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STUTTERING AND STAMMERING (LISPING).

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Stuttering. The subject of stuttering must be viewed from a functional and structural point of view. It lies somewhere between the fields of normal and abnormal pyschology. The stutterers need not be distinguished physically from other people; they are of normal intelligence; their thought processes are logical. In the linking of ideas with the motor processes of speech, however, they are not normal.

The evidence for the diagnosis of this defect as primarily mental has of late been accumulating. It was formally thought to be due to permanent anatomical anomalies, which were amenable to surgical treatment.

Kussmaul holds consistently to the view that stuttering is a "spastic co-ordination neurosis." This view is adhered to by many modern writers, especially by those who approach the subject from the medical point of view. Gutzmann holds that every stutterer is neuro-pathically affected. Scripture claims that "stuttering is a distinct form of nervous disease * * ;* it can be properly and legally treated only by a physician." Mauken, for example, says that "many persons stammer (stutter) under certain conditions, largely because they think they will." All their past experiences with speech have combined to confirm them in the thought and it soon becomes a fixed "idea." Langwill believes that "stammering (stuttering) is essentially a functional affection—a neurosis, the result of the defective working of the complex co-ordinated mechanism concerned in the production of speech, and not a defect of structure."

Gutzmann, in spite of his agreement with Kussmaul, as indicated above, says: "In the physiology of stuttering we do not find the destruction of any separate fibres of special centers; also the connection between the sensory center and the ideational center, on the one hand, and the motor center on the other, are undisturbed. The stutterer simply does not succeed in making the co-ordination from the motor center to the speech organs well enough to produce the correct mutual functioning."

Physiologically the function of speech involves the co-ordinated action of the three musculatures of (1) breathing, (2) vocaliza-

tion, and (3) articulation. The aberrations from the normal that are found in the stutterer's speech, in respect to these functions, are the foundations upon which we base the practical exercises for speech correction.

By stuttering, as we have already defined the term, we designate individuals showing certain peculiarities of speech. One stutterer, for example, will make spasmodic contractions of the lips, tongue, etc., whereby a word like "mother" will be pronounced or produced as "m-m-m-mother." Another will open his mouth wide and produce "a-a-a-" before he can say a word. Another will find himself suddenly unable to speak at all at the beginning or in the middle of something he wants to say. Still others are unable to speak certain words; others after woefully stumbling on the beginning of a sentence, will suddenly be able to rush through the rest of it cutting off the last words entirely, seemingly much relieved at the thought of having finished the effort. In fact, so numerous are the individual forms of stuttering that they defy classification.

Very frequently, however, writers attempt to baffle the layman by creating an elaborate nomenclature. Definitions are formulated which do not define but only confuse. Thus it has been the custom to try to differentiate between stammering and stuttering. Some writers tell us that stuttering is a form of defective speech that manifests itself in repetition of the initial consonant. Stammering they define as a sort of defective utterance, characterized by strangulatory and compressive effort—or any form of speech defect that is not stuttering. As pointed out previously we shall use the word stuttering as the Germans do; but before attempting to formulate a finer and fuller definition, we must make a somewhat extensive inquiry into the symptoms and characteristics of the defects that we recognize as STUTTERING.

Laryngeal cramps are a never failing symptom of stuttering. The muscles in and around the larynx become tense and fixed and the voice is often husky because of the lack of breath control. This most fundamental of all symptoms of stuttering seems to have escaped the notice of most writers on the subject. Cramps and spasms of the muscles of enunciation (lips and tongue) are those that are most apparent to the observer. The lips may be pressed tightly together for a short time when the patient tries to say "p," "b" or "m." In other cases they will open and shut, producing a series of p's or b's instead of one p or b. The tongue may be pressed so tightly against the palate that the t, d or n is two, three

or ten times too long. All the sounds may be similarly affected by these muscle cramps. The contraction of muscles not usually used in speech, such as those of the head, or eyes or even of the whole body, is less frequent but more striking. Each stutterer has a different peculiarity; but an almost constant symptom is excessive rapidity of speech. In some cases this is to be attributed to the desire of the stutterer to get his words out before he is caught, or before anyone can interrupt him. In most cases, however, it is the expression of nervous anxiety due to intense fear. How the interpretation of stuttering has developed may be seen from the following quotations.

About ninety years ago Dr. Neil Arnott described the laryngeal cramps in his "Elements of Physics." In a book by Dr. Wyllie, "Disorders of Speech" we find the following: "In the common variety of stuttering, the speaker neglects the laryngeal mechanism; and when no speech is emitted, he unwittingly throws increased force into the wrong quarter, viz, the oral mechanism whose nerve centers thus become surcharged with energy, which may overflow into other centers and produce spasmodic complications. That this defect of speech in the common variety of stammering is due to delayed action of the laryngeal or vocal mechanism in attacking the first syllables of words is an old proposition; and is also to the present day maintained by the best writers on the subject."

Hunt, in his "Stammering and Stuttering" (pages 239-240) says: "Let us take a simple case: When the stutterer cannot produce a vowel sound—a vowel stutterer. In this case two actions are requisite; first, the air must be expelled from the lungs; next, the vocal cords in the larynx must be in a position to vibrate. The difficulty in this case is caused by the inability to associate the action of the muscles of expiration with that of the vocal cords. * * * To take a more complicated case: The stutterer can produce the sound but he cannot articulate it so as to form the desired vowel. Here the lungs act normally, but the disharmony lies in the co-ordination of the action of the vocal cords with the articulating apparatus. For instance, take the word *how*. His lungs being supposed to act normally, he sounds the aspirate *h* and a part of the vowel. Here we must observe that sound *ow* in the above word is a compound sound *au* and *oo*. He produces the *au* but fails in conjoining it with the succeeding sound *oo*. This requires the retraction of the tongue and the projection of the lips. The same difficulty of co-ordination is visible here. A stutterer of this kind, unless his respiration is at fault, in which no sound can be produced, finds no difficulty in pronouncing the pure vowel sound, neither has he any difficulty in the movements of the lips and tongue when not speaking; but when these are required to be

associated for the formation of speech sounds, he hesitates and stutters."

In a book entitled "Aphasia and other Speech Defects," by Bastian, we find the following: "Stuttering is a hesitating, spasmodic speech defect often beginning about the fourth or fifth year, much more common in boys than in girls, which is not due so much to want of precision or co-ordination in the action of several groups of muscular elements constituting the oral articulatory mechanism, but rather to the want of accord between the action of the laryngeal and the oral speech mechanisms. There is mostly a lagging action of the former."

However much of the truth there may be in the preceding quotations we feel that they are not an adequate interpretation of the whole difficulty but rather a description of symptoms produced by factors which they have entirely overlooked.

Bluemel in his "Stammering and Cognate Defects of Speech," says in his preface that he wrote in his preliminary notes:

"The true theory of causality must explain *all* the facts. It must explain the fact:

"That the stammerer (stutterer) can usually sing without difficulty.

"That the stammerer (stutterer) can often speak well alone.

"That the stammerer (stutterer) is usually fluent when speaking in concert with other people.

"That the stammerer (stutterer) can usually repeat fluently the words that are pronounced for him by another person by way of assistance.

"That a stammerer (stutterer) can usually repeat a word that he has eventually stammered out.

"That consonants followed by short vowels are more difficult for the stammerer (stutterer) than consonants followed by long vowels.

"That consonants at the end of a word never occasion difficulty.

"That the stammerer (stutterer) may have difficulty on words that commence with vowels.

"That the speech defect may assume the most diverse forms, being in one case passive, and in another active and boisterous.

"That one can stammer (stutter) in thought as well as in speech.

"That there are more male than female stammerers (stutterers).

"That stammering (stuttering) is rarely acquired after the fifteenth year.

Browning,* in his article on Thymus-Stammering, quotes the following descriptive designations and follows up his essay by a

*Browning, William, M. D. "The Etiology of Stammering and Methods for its Treatment"—Neurographs, Volume I, Number 4, June 22, 1915.

very clever and plausible theory in connection with large thymus. "Stammering is commonly considered an inherited weakness of the mechanism of speech a developmental neurosis (Hudson-Makuen), an infective neurosis, an anxiety neurosis (psycho-sexual, general, etc.) or fright inhibition, a disturbance of the cerebral or cortical speech centers, a transient auditory amnesia (Bluemel), a spastic *inco-ordinationsneurosis* (Fuld-Romberg, similar to Kussmaul's designation as a spastic *co-ordinationsneurosis*, ataxia of the speech mechanism, an associative aphasia (Hoepfner), a mental tic, a disturbance of the will, a psychosis, a diseased state of the mind (Scripture), or something intangible and speculative, that it seems crude to offer any simple comprehensible interpretation.

To say that stammering (stuttering) is the result of fear (aphobia), fright, psychic insult, amnesia, auto-suggestion, mental confusion, multiple thought, sexual suppression, lack of confidence, or what not, fails to explain essential features of the disorder. Such things may be in play at times, but do not account for the underlying condition.

Nor is the claim any more satisfactory that, "Many, perhaps most, cases find an immediate cause in imitation" (Desslar, 1913), although that may on occasion be the exciting factor."

Before we state the interpretation at which we have arrived we wish to call attention to certain facts in the stutterer's speech which have led us to our conclusion.

(a) Much has been said by different authors as regards the comparative difficulty of the various sounds of the alphabet, some claiming that the difficulty is with the vowels and others with the consonants. We, however, have found that our patients have difficulty alike on all sounds. The individual usually finds trouble with particular combinations of sounds but these change from time to time thus making it evident that there is no constant difficulty in the production of particular sounds or combinations of sounds.

(b) If you will observe the orthographic representations of the stutterer's speech, you will find that he never has any trouble with the end of the word; his difficulty always lies in beginning of the word; for example, he will have difficulty on such words as *did*—d-d-d-did; actress—a-a-actress; pepper—p-p-pepper. It will also be noticed that the letters of the alphabet in isolation never trouble him. But such letters as *a* and *i*, which convey meaning, often occasion most pitiable spasms. Thus it becomes evident that the stutterer will have difficulty with the smallest unit of speech that has meaning.

(c) It must further become evident to anyone who is familiar with stuttering that certain facts, almost paradoxical in nature, are to be found in the speech of a stutterer. He talks perfectly when alone; he sings without difficulty; he speaks well in concert; he can usually whisper or talk in a voice not natural to himself, and indeed he can often speak fluently amid distractions, noises, etc. There are other situations analogous to these where the stutterer's difficulty disappears. Various authors have attempted to interpret these facts separately but we know of but one interpretation that will explain them all.

(d) Our experimental work has shown that there is no uniformity in the point at which the spasm appears in the several musculatures involved in the speech process. The same physiological difficulty recurs in the individual. His breathing is always at fault; it may or may not be in the particular case, the place where the spasm first appears. There is, further, some experimental evidence to show the presence of strong emotion, but whether that is consequential or sequential, must yet be determined.

We have naturally been influenced in our interpretation of the foregoing facts by the results which we have attained in our efforts to develop a satisfactory method of therapy. The only conclusion which affords a satisfactory explanation of the facts and which incorporated in our teaching has proved a success is that the fundamental difficulty is an abnormal self-consciousness; and that the only way to eliminate it is through distraction—either by direct or indirect suggestion. Whether this abnormal condition be a result of an inherited predisposition, traumatic shock, or any of the other causes which we have mentioned, or whether it is produced from time to time by the presence of a subconscious complex, or whether we should call it compulsion or anxiety neurosis —we are not yet prepared to say. The fact, however, remains that a positive program of constructive suggestion will supplant the difficulty.

The correct production of words depends on two things: (1) correct auditory impression and (2) correct muscular feeling. The enunciation of the consonants is dependant especially on the sense of muscular feeling. Try it and see: *t, s, m, n, r, l.* Will you not invariably pronounce the consonants correctly by proper placing of the tongue, lips, teeth, etc? The production of the *vowels* depends upon the correct auditory image being in your mind. If these two things are borne in mind they will suffice to show how our method accomplishes a dual purpose. On the one hand, it reconstructs and

makes firm in the mind and consciousness of the stutterer those fundamental element of speech without which our linguistic attainments would be rendered impossible; on the other hand, an ever-present consciousness of the kinesthetic sensations involved in difficult combinations of vowels and consonants furnishes one of the most potent and lasting distractions which we have been able to find.

It has been our observation that certain stutterers speak more easily words which contain the long vowel sounds. For instance, they will find no difficulty with the words such as *fate, bite, kite, coat;* but they are apt to stutter woefully on *fat, bit, kit, cot, etc.* It may be possible that this is due to the fact that the auditory image of the short vowel is less tangible and harder to recall than that of the long vowel. We are rather disposed to think, however, that the greater muscular dexterity involved in producing the short vowels in a syllable is responsible for this condition. However this may be, the teacher will find that an emphasis on the character and stress of the long vowel will furnish a very subtle and effective way of distracting the pupil from the consciousness or fear of his malady. As a matter of fact several educated stutterers who noticed that they could more easily utter words with long vowels modified their speech accordingly. For instance, a young chemical engineer would always say, "I shall dine" instead of, "I shall eat my dinner." He would also say "sameness" instead of "similarity"; "metronome" instead of "metronome," etc. It may be that the explanation in this particular case is not simple. It is possible that auto-suggestion was potent or it may be that the long vowels were physically more easy to produce; or again, it may be that the greater euphony involved with the long vowels was responsible for his success with them. But here, as elsewhere, we feel obliged to rely for an explanation on the fact that his entire absorption in finding a synonym sufficiently distracted him from his personal supersensitiveness.

For a time we were of the opinion that the stutterer's early acquisition of language was in part to blame for his difficulty; i. e. we thought perhaps that the elementary parts of the speech technique had not been properly established so that when it was combined in the ordinary highly involved speech process the co-ordination would not stand the strain. We realize the fundamental necessity of establishing these early elements of the speech process and the necessity of making them secure not only by the frequency of repetition but by instilling them into the child at that early age

when they will establish themselves permanently. Probably when the child begins to stutter at a very early age he refrains from speaking to such an extent that he does not get the usual amount of practice, but the ability of the stutterer to speak in particular situations and the fact that we have experimentally proved his ability to talk correctly when alone, force us to the conclusion that the difficulty is not inherent in the speech mechanism itself, but is the result of one or more outside factors such as we have already suggested."

Naturally it is of great concern to us as teachers of speech correction to have some understanding of the way in which any emotional disturbance or any well organized neurosis can interrupt the speech process. When one reflects upon the complexity of our linguistic attainments it must become evident that the actual physical production of voice and articulation, involved as that is, is simple as compared with that process which gives rise to the expression of thought. We have already pointed out that the stutterer's difficulty seems to be limited to speech which is significant, for with all rote material he has no trouble. Indeed, all our highly coordinated mechanisms become more involved as we trace them from the periphery to the brain center. Without doubt this has something to do with the fact we just mentioned that the stutterer's greatest difficulty appears when he is creating language from the expression of his own ideas. All of our human attainments which become reflex or automatic are developed in much the same way. In every case we begin with certain instinctive reactions. To these we add more and more by a conscious effort but as each becomes perfected it dwindles from the field of consciousness little by little until it fades below the threshhold and becomes automatic.

It is surely true that these automatic processes are our greatest assets and really accomplish more perfect tasks than those other processes which we must consciously direct. Most of our experiences include an ample number of examples as to make clear what we mean when we say that when, for one reason or another, we become conscious of what we are doing automatically, the operation is considerably impaired. Perhaps a case in point is the chauffeur who for one reason or another becomes conscious of his feet or his hands and runs into a curb. The question will probably arise why this abnormal consciousness should attach itself to the speech mechanism in the stutterer and not to his other automatic performances. To be sure, examples have been cited of stuttering in writing, in deglutition, but these seem to be very isolated cases.

On the one hand, speaking is more involved than these other processes, but we believe that the real reason for inco-ordination appearing here lies in the fact that the personal equation here is much greater than elsewhere. Professor Sidis, in his book, "The Psychology of Suggestion" tells of his experiments in which stuttering was induced by external suggestion. By merely extending his hand he was able to make one of his subjects stutter. As a matter of fact, speech is so delicately adjusted that we find after several day's hard work in company with stutterers that our own speech is affected and we are prone to stutter too. But the reason why the normal individual does not become a confirmed stutterer as the result of painful experiences in slips of the tongue is that his personality is so organized as to resist the fixation of such a habit. The stutterer on the other hand, and we feel that we need make no exceptions, has a neuropathic disposition which furnishes fertile soil for these tares.

If we were to enumerate at length the various methods which have been followed in the treatment of stuttering with more or less success, we should have little difficulty in showing how each one by some trick has accomplished the necessary distraction, from the beating of a finger, to the teaching of a falsetto voice; or such a method as placing the tongue in the roof of the mouth before attempting to speak or yet again some particular unnatural way of taking a breath, a principle which has formed some part of almost every school's methods. They have all consciously or not owed what success they have to the efficiency of the distraction. There seems to be considerable difference of opinion as regards the success of psychoanalytic methods of treatment but certainly their avowed method is that of suggestion. We wish to point out, however, that the value of suggestion and distraction in this case depends not only on its efficacy but on its permanency.

Any method that aims to divert the patient's attention from an abnormal consciousness of his difficulty must accomplish this distraction subtly or the results it brings will not last. As a matter of fact, by tapping a finger against the body works successfully for a time but then its potency disappears. We should naturally expect that this would be the case, for when any such performance, obviously not a part of the speech process, becomes habitual it loses its distracting effect. The requisites, then, for an adequate method of distraction are, first, that whatever activity is relied upon must be a part of the speech process; second, that the stutterer believes it to be absolutely necessary to his success. To accomplish this we have worked out the methods presented in a chapter on therapy.

The term *cluttering* is applied to speech that is characterized by great nervousness which shows itself in excessive rapidity of speech with indistinct enunciation. Great haste and reckless rushing through what is to be said causes the disaster. The nervous hurry of the patient's mind makes him form and combine the sounds imperfectly; consequently sounds, syllables and words are mumbled together. The breathing may become spasmodic and irregular. Cluttering and stuttering often coexist but they may be distinguished from each other by the nervous haste of the one and the nervous fear in the other. Another difference is noted in the fact that the clutterer speaks better the more he thinks about his speech; the stutterer often speaks better the less he thinks about it. The clutterer shows negligence and lack of self-control; the stutterer cannot release himself from anxiously watching over his speech.

The therapy for cluttering consists in tongue gymnastics, exercises in enunciating words singly and in combination, and in speaking slowly and distinctly. If the clutterer is forced to enunciate certain sounds such as the explosives or *s* very distinctly he is obliged to speak slowly, and can thus learn to enunciate all sounds better The use of the metronome for slow speech is especially recommended and shouting through a megaphone for distinctness is a most helpful exercise.

Stammering (*Lisping*). Under the term stammering we understand with Gutzmann, Liebmann and other scientific authorities, those disturbances of speech which are due to the faulty pronunciation of the different letters; thus we differentiate this condition from stuttering which is a fault of the course of speech, stammering being a fault of enunciation alone. Lisping is a part of stammering and concerns itself with the faulty pronunciation of *s* and its related sounds, such as *z, c, th.* In English literature on the subject of speech defects, the term lisping is often wrongly used, as it is made to include all the defects of enunciation. The medical profession as well as the laity are, therefore frequently puzzled by the terms stuttering, stammering and lisping, not knowing which defects are referred to when these terms are used. We shall take for granted that all those defects usually classed under lisping are termed stammering and reserve the term lisping for the special defects of *s* and *th* alone.

Up to the present time stammering, lisping, etc., has been more or less considered an acquired speech defect due either to negligent habit, to organic disturbances of the organs of speech, or to nervous disorders. Very little stress has been laid on the congenital factor

of lisping. In the neurotic type of lisping, of course, there was always presumed some hereditary underlying basis, but it was more often attributed to hereditary affection of the general nervous system than to the centers of speech. We believe that congenital lisping in many instances is due to hereditary changes within the centers of speech and is almost always combined with lack of co-ordination of these centers of speech with the center of breathing.

During the normal child's first attempt at speech, lisping occurs on account of the lack of training of the centers of speech. Baby-talk is a natural condition of early childhood, but when the child, through constant observation and attention, learns to differentiate the various sounds acoustically and to imitate them optically, the co-ordination between the centers of speech, the center of breathing and the articulatory organs is brought about, provided there is no inherited or acquired disturbance of them.

In stammering, lisping, etc., the discrepancy between the articulatory organs and the breathing is very evident.

Organic causes, of course, sometimes present themselves. When the formation of the jaws is such that the teeth cannot be brought evenly in line, the sibilant sounds *s* and *z* will be defective; when the tongue is too closely tied to the lower jaw, the sounds *t, d, n, l,* and *r,* will be wanting in clearness. The dentist may do much to rectify the former and the surgeon the latter, as we have said before.

*Organic Lisping.** Organic lisping is the term applied to such speech disorders as arise from anatomical defects of the speech organs. Under this heading we shall discuss the following:

1. *Lisping from hare lips or from feeble lips.* The former requires first the surgeon and then both defects may, in some cases be aided by massage, electricity, and lip gymnastics. The lip gymnastics should include especially the pressing them tightly together, holding them tightly while the breath is pressed against them, pouting, puckering; whistling, blowing soap bubbles, paper bags, blowing out candles, etc. This kind of treatment must be very carefully given for the lips may not only be feeble but disabled as the result of disease, in which case the treatment must be medical. Under the heading of negligent speech we shall give further illustrations and examples for the correction of all mispronunciation.

2. *Lisping from tongue defects.* When the tongue is too thick, too small, too clumsy, or injured, the resulting inacuracies may be mitigated by careful gymnastics and training by means of a mirror. One tongue defect known as hemiatrophy of the tongue shows

*Scripture, E. W. Stuttering and Lisping. MacMillan Co., New York, 1912.

itself in smallness of one side of the tongue, in grooves in the surface and in fibrillary twitchings. With such a tongue the speech of one girl was so indistinct that she could not get along in school and as the cause was not known was considered mentally dull. The correction and scolding at school and at home had produced intense depression. As the cause, hitherto unobserved, was diagnosed at the clinics as hemiatrophy of the tongue which made it difficult to use the tongue properly, it was known that organic lisping existed; this mispronunciation had so confused her that she made all sounds indistinctly and then was also a victim of neurotic and negligent lisping. A little girl of ten with the left side of her tongue so incapacitated that all front lingual letters were indistinct, she improved so well under careful guidance with tongue gymnastics and the mirror, that not only did the speech defect disappear but the mental and physical condition improved to such an extent that the whole character was remodeled.

*Hemiatrophy of the tongue** is often responsible for some of the lisping met with in children whose mentality is considered deficient. A Binet test of these cases is very necessary to establish the mental status, for often the apparent dullness that accompanies this defect may be explained by the constant reproof and shame the mispronunciation of *t, d, s, l, sh,* subjects them to and not to any mental retardation.

3. *Lisping from tongue tie.* When the frenum of the tongue is too short it prevents the tongue from rising sufficiently in front to cut off all the air except that which comes through the small channel across the top of the tongue to make the sound *s.* The sound actually produced in such cases is more like *th* than *s* and the defect is very common. If a person can project the tip of the tongue between the teeth, the tongue is free enough for correct speech and with a few tongue gymnastics the muscles may be stretched and the mispronunciation remedied.

There is an antiquated belief that tongue tie causes stuttering. It cannot do so directly, but there are cases where the lisping due to tongue tie has made a person so nervous that he has become a stutterer also.

4. *Lisping from jaw and tooth defects.* Overshot and undershot jaws are due mainly to irregular development of the teeth. In excessive cases of overshot or undershot jaws the projection may be so great that the lips do not close properly for *f, v, p, b, m,* or round themselves sufficiently for several of the vowels. In these and sim-

*Scripture, E. W. Hemiatrophy of the Tongue with Defective Speech. Jour. A. M. A., Jan. 13, 1912.

ilar cases it is frequently difficult to adjust the tongue quite correctly, especially for *s*. With strongly undershot jaw the *s* sound may be produced as the tongue moves to its position to make *t;* thus "tool" sounds like "stool." When the upper teeth project much beyond the lower ones it is frequently difficult to adjust the tongue so that the jet of air strikes the lower teeth correctly for *s;* the sound is rather like *sh*.

For many jaw and tooth defects the most important therapeutic procedure is orthodontism. If the child who has these defects is under sixteen years of age, he should be put under the care of the special dentist. The form of the dental arches and the relation of the teeth to the vault of the palate is necessary for the production of certain sounds, and if these relationships are abnormal these sounds are difficult to produce. As we have already pointed out the movements of the tongue are important in the production of many sounds and the position of the tongue in the mouth cavity determines the air space and so affects the quality and direction of the air waves which give the carrying power to the voice. Thus, a constricted dental arch cramps the activity of the tongue and modifies the air spaces. The deformity resulting from the disturbance of the normal development of the teeth can be cured or greatly improved, if the proper course is pursued during the period of growth. The treatment for the malocclusion of the teeth is within the last twenty-five years receiving careful attention. Early decay and loss of teeth resulting in over-development of jaws, protrusion, depressed expression around the base of the nose, etc., can also in the more matured individual be alleviated by the orthodontist. The chief aim of the orthodontist is to so supervise and supplement the process of dentition that the individual may have normally proportioned features and the possibility of a normal and pleasing voice.

5. *Lisping from high palatal arch.* This defect mainly affects the *s;* the person has difficulty in getting the tongue up properly against the palate to produce the small channel. Sometimes he lets the air escape at the sides, or the attempt to press the tongue up tightly leads to a strong spasmodic pressure at every *s*. In some cases the patients give up all effort at using the tongue for s, replacing it by a pause filled by a cramp in the larynx. They produce "sink" apparently like "ink." The distortion of speech produced by the omission of the *s* produces so much trouble that they acquire the strained harsh voice and the sad face of the stutterer. The defect can be cured or alleviated by careful attempts to get

the proper position. The spasmodic cases are helped by training in soft and relaxed speaking. It requires time and patience in correcting all these cases and one must not be discouraged while attempting to form new habits which are to replace the old ones.

6. *Lisping from cleft palate.* When the uvula cannot close the rear passage through the nose, all the sounds except the nasals are modified. All the explosives become nasal sounds; thus *p* and *b* become *m; d* becomes *n; g* becomes *ng; t* and *k* become *n* and *ng; s* becomes a snort; etc. The vowels are mostly all nasalized. Dr. Mitchell* claims that the improvement in the speech of a cleft palate patient may be greatly aided by the artificial means of restoring lost or missing tissues. In most cases where a surgical operation is performed there is a lack of tissue, which means that when operated upon, a shortening of the uvula and a stretching of the soft palate result, which does not improve the speech. In these cases a prosthetic restoration of the tissue undoubtedly gives better results. After the velum has been closed by operation, there may be little or no ability to raise it into place across the pharynx. Its muscles can be strengthened by the use of a velar hook, by breathing exercises, mouth gymnastics with stress laid upon developing the unused muscles of the soft palate. Exercises may be devised for teaching the use of the velum, such as blowing out a candle, playing a mouth harmonica, blowing soap bubbles, blowing feathers, pieces of tissue paper, small flags, etc. With a light illuminating the interior of the mouth the patient observes his velum in a mirror as he sings "ah" on a low note and then on a high note. The velum should rise for both notes, more for the higher ones. The loss of air during speech with a cleft palate naturally leads the patient to take breath repeatedly within a sentence. The habit may persist after the operation; in such cases systematic breathing exercises are to be diligently performed. The patient does them at first while holding the nose closed with the fingers; he gradually lessens the finger pressure and tries to substitute velar action. Electrical stimulation is often very effective while pursuing the course of exercises for control. To make the velum rise for the occlusives *p, b, t, d, k, g,* they are pronounced singly and in words with much prolonged occlusions and sharp explosions at the end. This cannot be done unless the velum is properly raised. The great effort involved in speaking with a cleft palate may lead the patient to the over exertion of all his speech muscles. This produces a grimacing

*Vethake E. Mitchell, D. D. S. Artificial Restoration of Lost or Missing Tissues in Congenital Cleft Palate and Other Deformities of the Mouth. Dental Cosmos, Feb. 1917.

speech: that is, the muscles of the face over-act. To remedy this, relaxation is taught by speaking with no lip movements, by singing and by exercises in melody.

Examination for vowels in velum defects. *Ah,* as in arm, art, ah. *A,* as in at, after, am. *Ay,* as in aid, ate, ale. *Eh,* as in ebb, effort, egg. *Ee,* as in eel, eat, easy. *I,* as in it, in, ill. *Oh,* as in old, owl, oak. *Aw,* as in awe, awful, ought. *Oo,* as in fool, tool, boor. *Oo,* as in full, pull, bull.

When velum defects exist there are often the following negligences: *first,* a careless confusion of sounds of *a;* second, indistinct *oi* and *oy; third,* a shortening of the *e* that finishes the sound of *a* and *i;* fourth, forgetting that *o* has *oo* attached to it; *fifth,* that *aw* followed by a vowel (drawing) has no *r* after it; *sixth,* careless pronunciation of *ow* and *ou; seventh,* failing to pronounce *u* as (*e—oo*) after *d, l, n, s, t.*

7. *Lisping from obstructed nasal passage.* Any obstruction in the nose deprives the nasal sounds, *m, n,* and *ng,* more or less of their peculiarly resonant ring. Thus *m* sounds like *b, n* like *d,* etc. This condition is found temporarily in severe colds; the turbinates in the nostrils become inflamed and swollen and the nasal cavities become more or less closed. Permanently enlarged turbinates or a deflected septum may cause a similar result. In the case of large adenoids the passage through the upper pharynx is also more or less obstructed. These defects should be cared for by a skilled laryngologist and when healed the patient should be given exercises in breathing, mouth gymnastics and vocalization, such as will re-educate the muscles that have, on account of the strained relations existing in the abnormal state, been unable to perform proper functions.

Negligent Lisping. The characteristic of negligent lisping, or functional lisping, is mental carelessness. This mental carelessness is undoubtedly not due entirely to any wilfull neglect on the part of the child. In some cases his "baby-talk" has become established as a habit and as he grows older he retains the imagery or symbols which he uses in speaking and comes to associate them with the correct pronunciation which he hears. Again, on the other hand, he may hear properly so far as the sensation is concerned but may perceive or understand the sounds wrongly as in word blindness, and when this is the case, he will of course, reproduce these sounds as he perceives them. If the sensation is at fault he does not speak properly until he comes to substitute the right kinaesthetic cues for his destroyed auditory ones. These conditions, i. e. the first two

mentioned, are impossible to detect so we include them with the case where a general disposition of carelessness is adequate to explain the lisping. A child, then, fails to produce sounds correctly:

1. *When he does not hear correctly what others say.*

2. *When he does not hear and feel the sounds he himself produces.*

3. *When he fails to perform the long experiments that most infants do in learning to talk.*

4. *When he does not even notice his own errors.*

The cure consists in teaching the patient to carefully correct his own faults, which he has not noticed, by constant work on the positions of tongue, lips, and palate for each letter singly, always using the mirror, training the ear to hear the sounds made in these correct positions and then by their use in syllables, words, phrases and sentences.

Hints for correcting some common types of lisping. We are here using the word in its general sense, i. e., inability to pronounce any particular sound or sounds, whether negligent, neurotic or organic.

Find out whether the difficulty is due to defective hearing or to some other organic trouble. If the trouble is due to very defective hearing the methods employed in teaching the deaf to speak should be used. If it is some other trouble have it corrected, if possible, by dentist or surgeon. Do not conclude, however, that every malformation in the organs of articulation makes it possible to correct a lisp. Malformations may be compensated for in many ways, so that an organic lisp can often be ameliorated or removed without surgical operations.

The simple front or "S" lisp. Here the *s* is pronounced as *th*. The tip of the tongue either protrudes between the teeth or touches the back of the upper teeth, instead of being drawn somewhat back of them.

1. Show the pupil exactly how to make the sound and let him try to imitate. Good results may often be obtained by imitation alone, especially with younger children. This is true for any sound.

2. Hold the tip of the tongue back with the end of a probe while the pupil pronounces *s*.

3. Have the pupil take a tongue depressor lengthwise between the teeth. The inner edge should be far enough inside the mouth to hold the tongue back from the teeth, in the *s* position. The tip of the tongue should be above the stick, but should not touch the front teeth. Drill first with the stick and then without it. Re-

move the stick while the pupil is prolonging the sound. Practice both with *s* and *z*.

4. Drill on special exercises for lispers.

The Side or "S" Lisp. Here the tongue is dropped low in the mouth, and the current of air, instead of passing directly over the tip against the upper teeth, escapes on one side of the tongue through the side teeth. This gives an ugly brushing sound.

1. Press, with the fingers, the upper lip tightly against the upper teeth on both sides, thus closing up all the side spaces through which air could escape. In this manner the pupil will be forced to send the air directly forward towards the front teeth.

2. Prod the tip of the tongue with a probe while the pupil pronounces the *s* sound. The irritation will cause the tongue to rise to the *s* position.

3. Jerk the pupil's lower lip down, as he begins the *s* sound, and release it immediately.

4. Drill on special exercises for *s* lispers.

The th lisp. Here *th* is pronounced like *t* or *d*. The tongue is in contact with the hard palate instead of resting against the upper teeth.

1. Teach the proper *th* position.

2. Let the pupil practice *th* protruding the tongue between the teeth. This will teach him that the *th* is a continuant and not a stop consonant, and at the same time get him used to sticking the tip of the tongue forward. This, however, should be only a preliminary step to teaching the correct *th*.

Frequently the *s* and *z* are made with the channels at the sides instead of the front. Instead of soap or soup, the patient seems to say sloap and sloup. The defect is corrected by teaching a correct *s* either by imitation of the sound as head by the ear, or by using a stick over the middle of the tongue as in the case of the occlusive *s* or *z;* the patient will close up the side channel as soon as one is made in the middle. Use sticks on each side of the tongue to hold it up tightly.

For *sh* the channel in the middle of the tongue is seen to be broader and differently formed when compared to that for *s*. The cure is often brought about by using a probe, or stick, as in the previous case; the irritation makes the patient narrow the channel. Sometimes it is necessary to make the patient use *t* instead of *s*. Practice: on one breath, *tun-sun, tin-sin.* *T* for *th* as tin for thin, *tree* for *three.* *T* for *dh,* as wid for with, trough for though.

In pronouncing the two sounds indicated by *th* the front of the tongue is raised against the palate and upper teeth, the tip touching so lightly that the air escapes over it. For *th* as in thin the larynx is silent; for *th* as in thine it produces a tone.

It is very common for children to use *t* and *d* for *th;* thus, they say tin, tree, tumb, for thin, three, thumb, and dis, dough, dee, for this, though, the. It is like the language of the loafer or the tough: "Are you wid me?" Yes, trou' tick and tin."

The defect arises from pressing the tongue too tightly, with the result that no air can issue from the mouth; this makes an occluded *th* that sounds like a *t* or *d*.

The cure consists in inserting a probe or stick at the side of the mouth above the tongue. When the patient tries to say *t* his tongue is pressed down across the tip and he is forced to say *th*. It is always useful to teach the use of the interdental fricative as a substitute for the defective *th*.

Neurotic lisping. Patients with this trouble often enunciate sounds in ways that resemble negligent speech.

One patient used *t* for *s*, *d* for *z*, and *t* and *d* for the two forms of *th*, the tongue action being the same as that described for negligent lisping. The patient also said *tsoe* instead of *shoe*. The patient had learned to talk clearly, but at four years of age she fell, striking her head; she remained unconscious for several hours. Shortly after this accident there were convulsions which were frequently repeated till the age of six. The defect of speech appeared shortly after the fall. There now is a tremor of the entire body when she attemps to speak as well as a tremor of the lips during *p* and *b* and a tremor of the laryngeal tone when a vowel is sung. It is difficult to get any loud or long sound; every sound, even a simple hiss is produced in a manner indicative of excessive timidity and almost of fright. These conditions never occur in cases of negligent lisping; the patients are always cool and deliberate; they are sluggish and phlegmatic instead of nervous. The similarity of this mental condition to that of a stutterer is evident.

The excessive tongue action in negligent lispers arises from negligent observation and careless action. The children with negligent speech are generally those that have grown up in surroundings unfavorable to careful enunciation, as among the poorer classes or where baby talk has been encouraged. These neurotic patients, however, have learned to talk clearly. Moreover, they are not careless about their speech, but over-anxious. The tongue does not touch the palate not simply because they are too negligent to take

the pains to leave a small opening, but because it is seized by an uncontrollable spasm.

It is evident that we have here a form of speech characterized by quick nervous muscular action instead of the deliberate smooth action required for normal sounds. In trying to make the *s*, for example, these patients are too nervous to carry out the fine adjustment requisite; they press the tongue too tightly and thus make a *t*. The result for the hearer, is the same as in negligent lisping, but the nervous processes in the two defects are quite different. Neurotic lisping is allied to stuttering in its causation (fright, or nervous strain) and in the presence of an emotional disturbance. It differs in having excessive muscular tension of a constant rather than a spasmodic kind; this results in speech somewhat like lisping and not in the peculiar sounds of the stutterer. It differs from negligent lisping in the fact that it appears in nervous persons and not in phlegmatic or dull ones, and that the muscular movements are cramplike instead of careless.

General treatment is mainly that for nervousness and the special speech treatment consists in explaining the trouble to the patient and then having him repeat sentences, answer questions and talk with great relaxation. The relaxation may be brought about voluntarily or by suggestion. An efficacious method of suggesting relaxation is to have the patient recline on a couch and gradually fall into a semi-doze while repeating sentences or while conversing.

55 Central Park West.

Infundibular Tumor in a Child Causing Diabetes Insipidus with Tolerance of Alcohol. L. NEWMARK, *Arch. Internal Medicine*, April, 1917.

The boy was 14 years old and had had diabetes insipidus continuously for five years. Signs of a tumor appeared only two weeks before death. The boy had a great craving and unusual tolerance for alcohol. On autopsy, a tumor occupying the region of the infundibulum was found extending forward through the lamina terminalis, between the frontal lobes and backward into the third ventricle, destroying the neurohypophysis and most of the pars intermedia. The pineal body was atrophied also. ED.

TWO CASES OF SYPHILIS OF THE EPIGLOTTIS AND ONE OF TUBERCULOUS GRANULOMA, ILLUSTRATING THE DIFFICULTY OF DIAGNOSIS IN THROAT LESIONS.

DR. HARMON SMITH, New York City.

1. Gumma of Epiglottis.—Mrs. M. D., aged 36 years, came into my clinic at the Manhattan Eye, Ear and Throat Hospital in December, 1916. Her history was as follows:

Family history negative, past history irrelative. Denied any venereal trouble. Six months previously had complained of difficulty in swallowing. Had a cough, slight temperature, loss of weight and other symptoms, which might be associated with a tuberculous condition. Was sent to the Mount MacGregor Sanitorium for six months, from which she departed to come to the clinic for further examination of her throat, as it was believed she had tuberculosis of the throat.

Examination of the pharynx was negative, the epiglottis appeared markedly thickened, particularly at the base, foreshortened and infiltrated, but did not give the characteristic edematous appearance of tuberculous infiltration, felt hard and there was a marked congestion of the aryepiglottic fold and all of the mucous membrane adjacent to the base of the epiglottis. The general symptoms and history of the case would naturally have led one to suspect this epiglottis to have been tuberculous, but the color was an intense bluish-red, unlike the pale edematous infiltration of tuberculosis. I consequently had a Wassermann test made, which was positive. One injection of salvarsan has resulted in the complete dissolution of the epiglottic involvement.

Examination of the lungs is negative and it is reasonable to suppose that her primary disturbance was specific rather than tuberculous.

2. Gumma of Pharynx; Laryngo-pharynx and Epiglottis.—B. F., aged 28 years, house worker, entered the Manhattan Eye, Ear and Throat Clinic in December, 1916. Both mother and father had been dead for many years; cause unknown. Five years ago she had had her tonsils removed. Previous to that time she had had a feeling of fulness in the throat, which did not abate after operation. During the past twelve months the patient has lost twenty pounds, has

*Read before the New York Academy of Medicine, Section on Laryngology and Rhinology, Jan. 24, 1917.

experienced difficulty in swallowing and has been troubled with cough, accompanied with blood-tinged expectoration. She now complains of pain on swallowing, difficulty in breathing and general malaise.

Examination of the pharynx revealed a large ulcerative destruction of the soft palate extending up to the hard palate and laterally a deep, ragged ulcer, extending from the posterior pharyngeal wall down to the laryngo-pharynx. The epiglottis was partially destroyed by a large slough. The larynx was invisble from the amount of tumefaction of the tissues just superior to it. Ability to swallow at all seemed impossible. The temperature was found to be slightly over 100°. The facies, pain on swallowing, temperature, blood-tinged expectoration, loss of weight, malaise and difficulty in breathing, would naturally lead the examiner to suspect tuberculosis. However, the amount of destruction was too extensive to have permitted the patient to continue her daily functions if it had been tuberculosis, consequently a Wassermann test was made, with a result of plus four, positive. One injection of salvarsan, followed by internal mixed treatment, has resulted in the disappearance of the ulcerative area and the extrusion of the brokendown cartilage of the epiglottis, with a subsequent cicatricial healing. Disappearance of temperature, increase in weight and general improvement of the patient in all respects demonstrates that the syphilitic condition, whether inherited, acquired or contributed through the operative measures for the tonsils and adenoids, was the underlying cause of her disturbance.

3. *Tuberculous Granuloma.* T. B., aged 32 years, came into my clinic at the Manhattan Eye, Ear and Throat Hospital in December, 1916. Her history was as follows: Married ten years, was never pregnant. Husband appears to be healthy and both deny any venereal history. Family history negative.

Past history: Had appendix removed eight years ago. About one and one-half years ago began to have trouble in her throat and complained of dyspnea on exertion, hoarseness and mucopurulent expectoration. She lost considerable weight and spat up a little blood, coughed continuously and felt very weak. The patient finally was sent to the Otisville Sanitorium and remained there three months, when she was discharged as improved. Has had several laryngeal operations (that is, pieces of tissue removed), the last being in June, 1916. In so far as she remembers she never had a Wassermann taken, but her sputum was examined and showed the presence of tubercle bacilli, one year ago.

Status praesens: Complains of slight cough, hoarseness and aphonia at times. Feels good and general bodily functions are normal.

Lungs: Left upper lobe, arrested lesion.

Larynx: Granuloma in interarytenoid space. Slight edema and thickening of aryepiglottic folds and slight edema of both arytenoids. Cords are thickened. Mucous membrane is congested and has a dry appearance.

Sputum examination: Negative.

Wassermann: Four plus.

January 23, 1917: Six grams salvarsan given intravenously.

44 West Forty-ninth St.

CERVICAL GANGRENE COMPLICATING LUDWIG'S ANGINA.*

DR. IRVING WILSON VOORHEES, New York City.

The patient is 51 years of age, and has hitherto been in excellent health. His family history is negative. His habits of life have been good, tobacco being used sparingly, and alcoholic liquors not at all. For some years past he has been troubled with rapidly decaying teeth, many of which have been pulled out. The remaining ones have shown evidence of pyorrhea at their roots, but he has tried to keep them as clean as possible through careful daily mouth hygiene. On September 23, 1916, he began to suffer from toothache, the pain being located in the right lower canine. Two days later there was a small nodule below the jaw corresponding to the drainage from the affected tooth. At this time I examined his mouth and throat and found both lower canines in the last stages of decay. The remaining roots were flush with the gum and the root canal of each was full of bright red granulation tissue. The patient was referred immediately to an extractionist, who removed both of these carious teeth under gas anesthesia. After removal the patient went

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to his home and remained away from business the rest of that day. On the following day the swelling had markedly increased under both the right and left inferior maxillae, but on the left side had begun to reach upward over the face and downward into the cervical region. He was put to bed and ice was constantly applied for twenty-four hours. At this time an examination of the throat showed marked edema of the entire left faucial region, and the process seemed to be encroaching on the larynx as there was some difficulty in breathing when lying down. It was evident that prompt and extensive incision and drainage should be instituted, so the patient was accordingly bundled into a taxicab and rushed to Roosevelt Hospital, where he was examined by Dr. Charles H. Peck in my presence. Dr. Peck concurred in the necessity for immediate action, and the patient was prepared for operation at once. Under novocain anesthesia, an incision was made from the angle of the left jaw and parallel with it almost to the symphysis menti. Dissection was carried out with fingers and forceps in an effort to locate the pus, but the mass was for the most part fairly hard and unyielding until the region of the angle of the jaw was explored, when a small quantity of very foul pus welled up into the wound. A cigarette drain was introduced, and the patient returned to bed. Temperature 104° F.

Diagnosis: Ludwig's Angina.—A culture showed staphylococcus. During the following week the temperature range was from 104.2° to 101°. At the expiration of this time the patient was unimproved, and the family expressed the intention of taking him away, much against the will of those in authority. On the morning of September 29 a second incision, about two inches long, was made by Dr. Peck nearly parallel to the first and lying about one inch above the clavicle. At this time the upper incision was a greenish-black, foul, sloughing mass and as the process was extending into the deep planes of the neck, through and through drainage was established by means of cigarette drains between the two incisions. Two hours later the patient left the hospital in the custody of a member of his family and was taken to his home where I again saw him.

At this time the upper wound was simply a mass of foul slough. The stench was so great that it was difficult to remain in the patient's room. Black, tarry discharge was also running out of the lower wound. At the hospital, the case was regarded by Dr. Peck and his assistants as hopeless, a prognosis in which I concurred. The family was told of the probable outcome, the last rites of the

church were administered, and all was put in readiness for the end. At this time the patient was very weak and unable to swallow nourishment.

It seemed wise, however, to do what we could, and Dr. F. E. Neef was called in. He agreed also in the prognosis. Nevertheless, we set to work to clean up the wounds under the strictest antisepsis and asepsis. Undiluted peroxid was dropped into the wounds for twenty minutes at a time, followed by normal saline. The bowels were cleaned out by enema, and every effort was made to feed the patient. This was happily more successful than was at first thought possible. The entire dressing was changed three or four times a day, as occasion seemed to warrant. At the end of one week the slough had pretty well separated, and it was possible to pick out great masses of necrotic material with forceps. The mandible was found to be denuded of periosteum, and one could very easily introduce an instrument as far upward as the jaw joint and downward almost to the clavicle. Small strips of gauze were left in the wounds at each dressing, but special effort was made not to block off the drainage by "packing." The most rigid sterile technique consistent with the surroundings was carried out in order not to introduce any other germ than such as was already present. After the slough had all been picked out, healing went on rapidly.

On December 3, just as the patient was about to be discharged cured, a great swelling recurred in the neck with pain and redness and there was every evidence of a lighting up from some unhealed focus. When the pus seemed to have pointed, I made an incision in the line of the lower wound, and a quantity of bloody pus escaped. A small, white object appearing at the mouth of this new wound was seized with forceps and the spicule of bone which you see in this little bottle came away. This had evidently sloughed off from the mandible. Since that time recovery has been uneventful and the patient is now regarded as completely cured.

Although the gas bacillus was not reported in the laboratory findings, gas was present in the wound and could be readily squeezed out with the fingers. It seems proper to regard this as a case of cervical gangrene complicating Ludwig's angina.

14 Central Park West.

TWO CASES OF NASO-PHARYNGEAL POLYPUS ORIGINATING IN THE MAXILLARY SINUS.

DR. HARRY L. BAUM, Denver, Colo.

In recent years many studies of the origin and mode of development of polypoid growths have been made and the subject has been very well covered, but the following report may not be without interest in view of the fact that the cases have been worked out in the light of former researches.

Case 1. J. J. F., age 47, presented himself at the clinic complaining of nasal obstruction, especially on the right, discharge, and frequent colds.

The right nasal passage had been completely obstructed for a period of two years. During that time he had suffered some acute pain in the right upper teeth when having a cold; the pain was increased by blowing the nose. There were no other symptoms suggestive of antral involvement.

Physical examination. Septum much deflected, accounting for left-sided obstruction. On the right, a large polyp was seen to occupy the posterior half of the nasal passage, seemingly springing from beneath the middle turbinate. A probe following the pedicle passed apparently into the antrum, and post-nasal examination showed an extension half filling the nasopharynx. The discharge was free from pus, being mucoid in character.

Both antra were dark to transillumination.

Operation. The right antrum was entered through the canine fossa. The cavity was found to be completely filled by a cystic polyp and when gentle traction was made on the mass in the nose it was seen to be transmitted to the antral growth. Upon opening this sac it was found to contain a clear serous fluid and to be free in the antral cavity with the exception of some adhesions at the junction of the floor and the outer wall. When torn loose at this point a small quantity of thick, creamy pus was liberated. There was no pus at any other point in the cavity.

The attachment of the antral portion was now easily found. It was on the nasal wall of the antrum just inside the ostium. Traction on the nasal portion showed its source to be identical with the antral portions. This common place of attachment was irregular and seemed to occupy a large part of the circumference of the ostium.

When separated from the bone by blunt dissection the whole mass was delivered through the nose, taking with it the collapsed antral portion and thus preserving the normal relations of the parts.

The ostium was but slightly enlarged, being only about four or five millimeters in diameter. This opening was increased greatly in size with punch forceps. The turbinates were left intact. No accessory ostium was found.

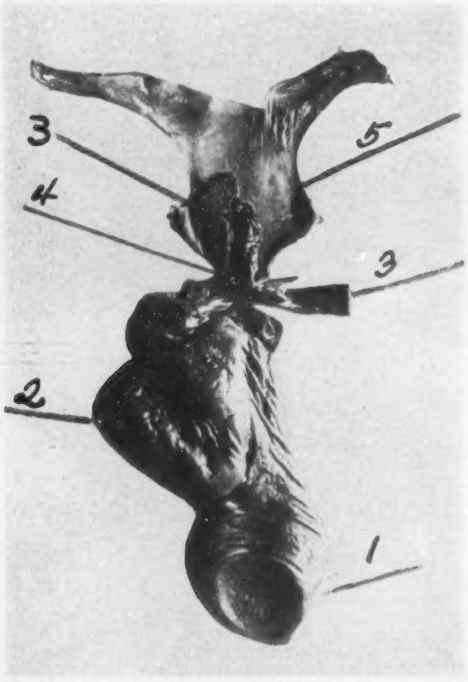

Fig. 1. Case 1. Gross Specimen. 1. Pharyngeal portion. 2. Nasal portion. 3 & 3. Attachment, torn in removal. 4. Constriction, at point of passage through ostium. 5. Remains of cystic antral portion.

A small piece of lining membrane was removed for histologic study. Macroscopically it was not noticeably diseased, the wall of the antrum being free from granulations or polypi.

An examination of the growth showed it to be divided into three portions: (1) A nasopharyngeal portion, firm and fibrous, typically a fibromyxoma, and springing from the same source as the antral portion. (2) The antral portion, a cystic polyp, now represented

only by its sac wall; (3) the small and fibrous root, from which they both grew and which was attached just inside the antrum along the margin of the ostium. (Fig. 1.)

Dental x-ray examinations failed to show the source of the walled-off abscess mentioned above and as the pus was sterile it was taken to be the result of a former antral infection of nasal origin.

In studying this case histologically numerous sections were made: three from the nasopharyngeal mass, two from the point of attach-

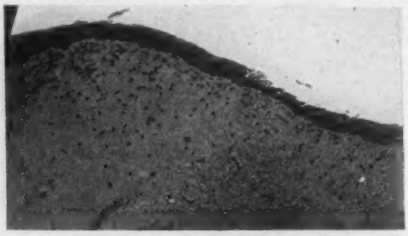

Fig. 2. Case 1. Nasal portion. This section shows character of epithelium very well. Stratified squamous with only a suggestion of columnar cells at one or two points.

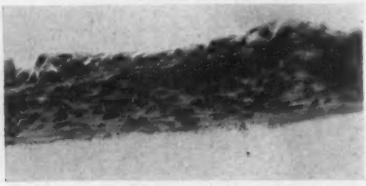

Fig. 3. Case 1. Thin wall of cystic antral portion. Shows entire lack of epithelial structure, cyst wall being largely fibrous tissue.

ment, two from the thin sac wall of the antral portion and one from the mucous membrane lining the antrum.

The nasal portion proved to be typically a fibro-myxoma as to structure with a covering of stratified squamous epithelium, contrary to the usual teaching regarding growths having their origin inside the antrum. It is true, however, that at one or two points changes were seen very suggestive of a transition from the normal antral type; where the cells, although stratified, had not lost their columnar form in the outer layer. None of these sections showed the presence of mucous glands. (Fig. 2.)

The sections taken from the base of the growth at its attachment showed signs of sub-acute inflammation with distention of blood vessels and marked round cell infiltration. The mucous glands were

also distended and mucoid change was evident throughout the sub-epithelial structure. Here the epithelium indicated more strongly its original type, for in spite of the fact that at most points it was purely stratified squamous in character, at certain places the covering consisted of several layers of flat cells with an outer layer of columnar type. No cilia were found.

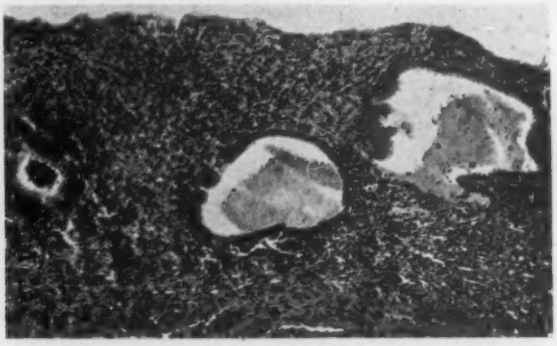

Fig. 4. Case 1. Lining membrane of antrum. Shows entire absence of epithelium with presence of dilated glands in sub-epithelial stroma.

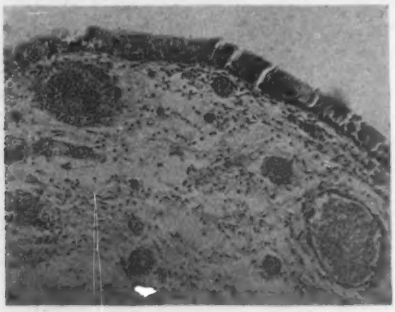

Fig. 5. Case 2. Section from antral mucosa. Note mucoid degeneration with inflammatory changes in blood vessels and quite typical antral epithelium.

The thin wall of the antral portion of the growth was found to be made up solely of fibrous tissue, with no epithelial covering whatever, excepting at its junction with the attachment where a single layer of cubical cells formed its covering for a short distance. (Fig. 3.)

The mucous lining of the antrum itself showed signs of considerable inflammatory change, with hemorrhage and round cell infiltra-

tion. Marked distention of the mucous glands was noted, even to the extent of formation of retention cysts. Surface epithelium was absent, presumably from pressure of the polyp which filled the cavity. (Fig. 4.)

Case 2. S. B., age 20, complained of nasal obstruction and discharge but had no pain.

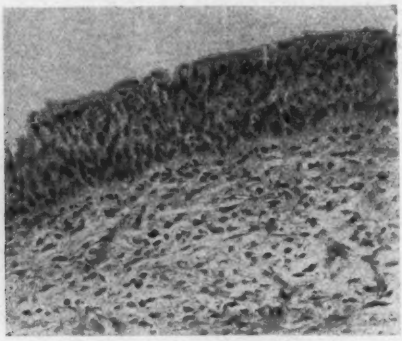

Fig. 6. Case 2. Nasal portion. This section shows thick covering of stratified squamous epithelium with an outer layer of columnar type, a typical example of what is to be expected in growths from the antrum.

Fig. 7. Case 2. Nasal portion. Showing loss of columnar epithelium, as shown in most of the sections. Probably due to pressure.

The right nostril had been completely obstructed for about a year, although the nasal condition had been abnormal for much longer than that.

Physical examination. Deflected septum. Posterior half of right nasal passage completely filled by large polyp, coming from under middle turbinate. The pedicle was quite large, being about one cm.

in diameter, and a curbed probe followed it easily into the antral cavity. Posteriorly, the mass was seen to practically fill the post-nasal space so that neither choana was visible. The discharge was mucoid in character, no pus being present.

Operation. The right antrum was entered through the canine fossa and its lining mucous membrane was found to be the seat of polypoid degeneration to a marked degree. Neither pus nor granulations were present, the secretion being mucoid in character. Traction on the nasal mass, after removal of the polypoid material in the antrum, showed its attachment to be practically identical with that in the first case. It grew from the nasal wall of the antrum just inside the ostium, its point of origin covering an irregular area several millimeters in extent and occupying a considerable portion of the circumference of the ostium. It was easily detached from this point and was then free to be delivered from the nose. The ostium was much enlarged, being a centimeter or more in diameter, but was made still larger by use of the punch forceps in order to facilitate ventilation and drainage.

The histology of this case differs but slightly from that of the other. Several sections were made, both from the interior of the antrum and from the growth itself.

Mucoid changes were more marked in the sections from the interior of the cavity than in those from the first case, with marked vascular dilatation and hemorrhage. The epithelium varied in character from a single layer of cubical cells to stratified squamous of typical form with many areas showing an added outer layer of columnar cells, but without cilia. (Fig. 5.)

The sections from the nasal portion of the growth showed typically a fibro-myxoma, more advanced in degenerative change than the first case and showing signs of slight sub-acute inflammation. Their covering was made up of a thick layer of stratified squamous epithelium, fading out in places to be lost altogether, presumably from pressure, and at other points presenting an outer row of cells typically columnar in type. No cilia were present. (Figs. 6 and 7.)

In conclusion it may be stated with certainty that the origin of these growths was from within the antrum near the ostium and it is also probable that considerable pathological change had taken place inside the cavity before the extrusion of the growth took place. This is concluded from the fact that both gross and miscroscopic findings indicated a more advanced stage of pathological change in the tissues from within the antrum.

It is difficult to explain the migration of the growth on other grounds than those of pressure and the findings in these two cases would sustain that theory, for both antra were themselves filled with pathological material. With the mucous membrane the seat of polypoid change in the region of the ostium, it is easy to understand its escape through that opening if its development within the antrum were prevented by lack of space.

The changes in the character of the epithelium show that disease and pressure can greatly modify the normal and call attention to the fact that a nasal growth, although coming from a cavity lined with a certain type of epithelium, may have its covering so changed as to present none or few of the characteristics of the mucous membrane from which it grows.

I wish to express my indebtedness to Dr. E. R. Mugrage for assistance in the preparation and study of the pathological specimens, and to Dr. Ross Whitman for the photomicrographs illustrating this report.

612 California Bldg.

NASAL AND AURAL POLYPI. THEIR PERMANENT CURE.

DR. CHARLES GLUCK, New York City.

Nasal Polypi. This condition, which formerly presented such untold wories to the nose and throat surgeon, is now capable of complete relief, to the intense gratification of both the patient and surgeon.

As generally found in the average patient's case, we have presented to us, on examination, either one or both nasal fossae more or less crowded with nasal polypi, springing from the middle turbinate and the structures which compose the anterior and posterior ethmoidal sinuses.

The cause, undoubtedly, is infection. This infection is facilitated and made possible by faulty ventilation and drainage of the nasal fossae. There are just two factors that are invariably present in all cases afflicted with nasal polypi, rendering this constant and re-

peated infection possible and bringing about this state of interference with ventilation and drainage of the nasal fossae. The first factor is a deflected nasal septum, frequently of the high acute variety, but it may be of most any type; for instance a deflection of the entire septum or a deflection of the lower two-thirds, usually complicated by an extensive septal ridge. The particular type of septal deflection does not matter from a standpoint of treatment, as will subsequently be shown.

The second factor of vast importance is the invariable presence of diseased tonsils (chronic tonsillitis). I have never as yet failed to find two diseased tonsils in the throat of every patient who has presented himself to me for the cure of nasal polypi. Aside from the septal deflection, which naturally interferes with ventilation and drainage, facilitating frequent nasal fossae infections, i. e., "colds," thus giving rise to hypertrophy of the nasal structures and mucous membrane, the tonsils, which in all these cases are in a chronically diseased state, are constantly being reinfected.

From my experience I have worked out a routine method of procedure, which I follow in all cases. I first remove, with a nasal snare and biting forceps, all the larger and smaller polypi that I can get hold of, treating that nasal fossa most heavily involved first, and if the other nasal fossa is also affected I treat that in a similar manner a few days afterwards.

Ten per cent cocain hydrochloride anesthesia, assisted by a one to one thousand adrenalin chloride solution, makes this quite a simple matter. If the middle turbinate is considerably hypertrophied and has undergone much polypoid degeneration, I also remove some of this, but always consider it advisable to remove as little of any turbinate tissue as possible. It is, however, frequently found necessary to remove a great deal of the middle turbinates, and also at the same time to open up and clean out the anterior and frequently the posterior ethmoidal sinuses, thus ridding these structures of their polypi and polypoid degenerated tissue.

My next step, a week or more later, is to completely remove both tonsils, by the finger-snare enucleation method, under one-half per cent novocain anesthesia, to which solution a few drops of 1-1000 adrenalin have been added.

I consider this step absolutely essential to the prevention of a recurrence. I consider the removal of the tonsils, in fact, the controlling key to all satisfactory nasal fossae work, on the assumption that the tonsils are the principal means whereby infection at all ages gains entrance to the body.

The next step is the straightening out of the nasal septum by means of a thorough, complete submucous operation. My idea is to give the patient as straight a septum as possible by completely removing the septal cartilage; any ridge or spur found on the septum is to be removed at the same time. I do this with the aid of a 10 per cent cocain hydrochloride anesthesia, aided by a 1-1000 adrenalin solution. The nasal biting forceps, I have found my most favorite instrument.

In the last few years I have had many cases of nasal polypi and have treated them all as above outlined, without a single recurrence up to the present time.

Aural polypi are treated along lines quite similar to nasal polypi. In treating aural polypi we are dealing with a chronic purulent otitis media complicated by the presence of polypi growing through the perforation in the drum.

My method of procedure is as follows: I first free the ear of as many polypi or their remains as possible. The patient is advised to use a few drops of (1-2000) bichloride solution, following the instillation of peroxide of hydrogen, hot douche, drying with cotton, and then the use of the bichloride as an after-treatment. The next step is to completely remove both faucal tonsils by the snare.

Frequently the next day the patient will feel grateful for the improvement of hearing to the spoken voice. All cases affected with aural polypi of one ear will also be found to be suffering with chronic catarrhal otitis media of the other ear. This ear is always benefitted by the removal of the tonsils and the other work outlined and in fact it is the proper method of treatment for catarrhal otitis media.

In all cases of purulent or catarrhal diseases of the ear which are invariably associated with deficient hearing, I also treat the pharyngeal vault in the following manner: Either under general anesthesia or preferrably under local anesthesia I remove all traces of adenoids and adenoid bands in younger people. In older people, who have very little adenoid vegetation, I break up all the adhesion bands, the remains of the adenoids, and remove any adenoid tissue, should such still be present. This is accomplished first by the use of the adenoid curette, followed immediately by inserting the index finger and breaking up these bands, which will be found extending between the Eustachian tube and pharyngeal vault. The next step, which is almost invariably necessary in every case, is straightening and reducing the thickness of the nasal septum by a complete submucous operation.

Under these methods the aural polypi will never recur, and the aural discharge disappears quickly; the chronic purulant otitis media will continue to improve uninterruptedly. The chronic catarrhal otitis media of the opposite side will, from this time on, show continuous marked improvement with a steady gain in the hearing, in cases not too far advanced, and some inprovement of hearing in all, except those affected by "nerve deafness." The latter form a small minority as compared to all persons suffering from impairment of hearing.

The idea associated with this work is that we are producing normal states from abnormal ones. We do not, as was suggested recently, close up the Eustachian tube, and ingraft an abnormal condition on an already existing one. But by the methods above outlined we do the reverse; we attempt to make the parts as normal as nature herself would want them to be, and can prove this by observing that both the hearing and health of the patient continue to improve steadily thereafter. Hence, in the final analysis all this is nothing more or less than work of reconstruction. It is an attempt on the part of the surgeon to reconstruct the parts as nature would have them.

It is gratifying to observe the closure of drum perforations, and the renewal of the drum subsequent to the proper execution of this work in all young subjects up to about twenty-seven years of age, and also in older people, depending on the chromicity of the case. By means of this work we bring about normal ventilation and drainage of the Eustachian tube and middle ear, just as we do in the nasal fossae. The middle ears thereafter blow themselves out normally, as an automatic act; hence rarification of the middle ear is an impossibility. The catarrhal swelling of the mucous membrane of the Eustachian tube and that of the middle ear subsides and becomes normal; the tube remains patulous and can be blown out freely and easily a few weeks following the treatment suggested above.

In passing I would like to mention that the tinnitus which is invariably present in all these catarrhal or purulant middle ear cases, and which is such a distressing symptom, is greatly lessened, as most of the patients will admit, to at least a bearable degree. This work is the only treatment that I know of that has such an ameliorating effect on the tinnitus.

2626 Broadway.

PRIMARY EPITHELIOMA OF THE PHARYNX AND LEFT TONSIL.

Dr. C. H. Weintz, Cincinnati, Ohio.

This case is reported through the courtesy of Dr. Samuel Iglauer, Director of the Laryngeal Service at the Cincinnati General Hospital.

The patient was an adult white male, 48 years old, a native of Sweden, a draughtsman and mechanical engineer by occupation. He was admitted to the Cincinnati General Hospital on September 28, 1915, complaining of a very sore throat and hoarseness.

Family history. Negative for malignancy.

Previous history. Ten years ago a growth was removed from his left upper lip. The site healed and has been well since then. He has had occasional attacks of mild sore throat, but not limited to either side. He smokes three to ten stogies or cigars in a day, and in the last five years, he has smoked a pipe quite often.

Present illness. Three or four months before admission he began to experience painful swallowing and mechanical difficulty in swallowing. The pain was scratching, more than lancinating or shooting. The throat felt full and irritable and caused him to cough a great deal. The patient was under medical care before admission, but the dysphagia, disphonia and moderate dyspnea, led him to seek hospital treatment.

He is markedly emaciated and in poor general condition. The breath is very offensive. The teeth and gums are in wretched condition. Bronchial breathing is heard over the right lung, and rough breathing over the apex of the right lung posteriorly.

Throat examination shows a large gray fungating mass, entirely covering the posterior aspect of the left tonsil and pushing the tonsil forward. This mass spreads upward over the junction of the pillars, which is stretched until it spans almost to the other side of the throat, where the uvula is lying almost in apposition with the right tonsil. The left anterior and posterior aspects of the uvula are involved from top to bottom in the growth, and while the right side of the uvula appears far from normal, the tissues are not covered with the gray deposit or necrotic tissue as is the left side. Above the base of the uvula the growth extends from the middle line, distinctly across to the right side. The

growth has elevated well-defined borders and the tissue beyond seems entirely normal. The gray necrotic material is easily scraped off, showing a mild capillary hemorrhage beneath. The thick left pillar and the grossly enlarged uvula materially interfere with the act of respiration and speech. The right tonsil and the entire superior posterior pharyngeal wall are uninvolved.

There is marked enlargement of the left chain of cervical glands and a moderate enlargement of the right chain of glands.

The patient received twenty to sixty-five grains of potassium iodide daily from September 28 to October 7, without effect on the throat. He also received a full dose of neosalvarsan on October 2. Blood taken for a Wassermann test on October 1 was negative.

Microscopic diagnosis from the section, *epithelioma.*

October 9, 1915. The patient was transferred to the laryngeal service and pronounced inoperable.

October 12, 1915. Coolidge tube exposure, followed in a few hours by marked and persistent edema of the neck with rather urgent dyspnea and expectoration of bright red, frothy blood. He also complained of pain in the chest. The swelling subsided in twenty-four hours but the chest pains continued for forty-eight hours.

October 20, 1915. Another x-ray treatment was followed by slight swelling of the neck, but not as severe as the former attack.

October 30, 1915. Coughed a good deal; weaker.

November 10, 1915. Fainted to-day. Much weaker. Urine negative for sugar, albumin, acetone, diacetic acid and occult blood.

Blood count shows a marked anemia. Hemaglobin, 54 per cent; reds, 2,560,000; whites, 12,100; polymorphonuclears, 85 per cent. *Blood pressure.* Systolic, 90; diastolic, 65.

November 19, 1915. X-ray. Broadening of mediastinal shadow.

November 21, 1915. Marked caput medusae noticed. "Area of retrosternal dullness, which is high up, fades into heart dullness. None of the usual signs of aneurism." (Dr. Morris.)

December 5, 1915. X-ray treatment followsd by considerable swelling of neck. Difficulty in speech.

December 7, 1915. Another x-ray treatment.

December 8, 1915. Died 4 p. m.

Necropsy, December 9, 1915, by Dr. Paul G. Woolley, Pathologist, Cincinnati General Hospital.

Clinical diagnosis. Epithelioma of the pharynx and tonsil.

Anatomical diagnosis. Epithelioma of tonsil and pharynx with metastases in the cervical lymph glands, mediastinum, pleura, lungs,

diaphragm, gastric and mesenteric lymph glands, kidneys and liver; edema of the lungs; peripheral arteriosclerosis; cachexia.

Necropsy. A body of an emaciated, anemic, sallow man of middle age. The mustache and beard were scanty like that of a Chinaman; there was no hair on the thorax or abdomen. The pubic hair had the feminine distribution. The abdomen was scaphoid and the neck appeared thick, a condition which was due to partially diffuse, and partially localized enlargements involving the lymph glands on both sides. The upper teeth were mostly gone. The lower ones were in an advanced pyorrhoeic condition. There were superificial abrasions just below the patellae.

When the body was opened, the lungs did not collapse, despite the fact that there were no pleural adhesions except at the apices. The subcutaneous tissues of the upper thorax and neck were edematous. In the abdomen there was little of note at first sight except that the transverse colon had a long loop which reached into the pelvis. The whole colon was dilated—the sigmoid was very small. The deep epigastric arteries, the iliacs and femorals were markedly sclerotic and had a "chicken trachea" appearance.

Dissection of the neck showed that all the lymph glands were involved by secondary carcinomatous growths. The upper ones were, as a rule, discrete, but in the lower angles, anteriorly, the growths were massive, so that no single glands could be made out. Through these masses, the great vessels passed. In the superior anterior mediastinum, the masses joined to form a single large mass, filling the upper half of the anterior mediastinum, pressing upon the vessels and adherent to and involving the manubrium. The heart, cervical organs, tongue and pharynx were removed *en masse*. The original growth seemed to be in the region of the left tonsil (at the upper pole), and involved the posterior pillar and the uvula and extended down just to the right tonsil, which was not apparently involved. The growth in this region was a shaggy, almost cauliflower mass superficially, but firm and almost white in its deeper parts. It was from this that the cervical glands were affected.

The left lung was voluminous and pale. In its substance were many nodules, mostly not larger than a petit pois, usually smaller, which were pale, fairly well circumscribed and sometimes with yellowish streaks in them. The lung, as a whole, was moderately edematous (600 grms.). The right lung also was studded with tumor nodules. The pleura, covering this lung, showed nodules

resembling those in the lung tissue, but rather button-shaped and larger than the others. Upon the diaphragm were still others. This lung was also edematous and pale, (735 grms.).

The heart, trachea and cervical organs were preserved for the museum. (No. 5165.)

The spleen (140) was firm and congested. There were no growths in it.

The liver (1685) was pale and in its substance were numerous tumor nodules. A few of these were visible upon the surface, but there were far more of them, from 1 to 10 m.m. in diameter, in the substance of the gray, edematous, anaemic organ.

The kidneys (left, 210 grams; right, 175 grams) were juicy and congested with pale markings. In both were very numerous metastatic growths, many of them having the form of infarcts. The capsules were free, except when they were attached by infiltrative growth of tumors. The kidneys were very edematous.

The intestines showed nothing remarkable. In the lymph glands of the smaller curvature of the stomach were lymph glands with metastases, and in the mesentery were large growths (museum 5166) radiating from which were vessels filled with miliary metastases.

628 Elm St.

THE CAUSE OF NON-SUCCESS IN SEPTAL OPERATIONS.*

Dr. Louis C. Vattier, Philadelphia.

In many cases that come under our observation for relief of nasal obstruction, the patient will inform you that an operation has been performed, and upon further questioning you will elicit the information that a sub-mucous resection of the septum had been done, with only partial relief of the former nasal symptoms. Upon inspection of the nasal cavities it is almost impossible to tell whether an operation had been performed or not, as the greater portion of the bony septum or perpendicular plate of the ethmoid would still be present; and the deviation of the upper third, which was really the causative factor of the obstruction, had not been touched.

*Read before the Philadelphia Laryngological Society, February, 1917.

The popularity of the sub-mucous resection of the nasal septum has become so familiar both to physicians and laymen, that rhinologists with small experience or timidity, fail to relieve the symptoms of the patient for which the operation was originally devised. This unique operation seems to have been considered by some operators as a panacea for all ills of the upper respiratory tract, and this probably accounts for the failures in many cases, and leads one to think of the old adage that still holds true, "A case with a proper diagnosis is half treated." The principal reason for the failure of the cases that I will quote are those in which the trouble lies in the region described by the late Dr. Ballenger as the "vicious circle."

High deviations are the causative factor of symptoms such as headache, anorexia, postnasal discharge, inflammatory conditions of the pharynx and trachea. The feeling of fullness in this region is due to the encroachment of the septum upon the ethmoid cells. This would also give the subjective symptom of anosmia. The lack of aeration to the olfactory fissure with the hyperemia following, is an etiological factor in frontal, ethmoidal and sphenoidal sinusitis, and, according to the amount of inflammation, producing middle ear revolvement and tinnitus.

Hyperplastic ethmoiditis, polypoidal degeneration and chronic inflammatory conditions of the mucous membrane and the ethmoid cells are frequently associated with deviation of the septum in this area. Unless this is properly corrected at the time of the operation the condition will not be relieved, but in a great many cases, will be aggravated.

Recalling the anatomical relation we find that the inferior border of the middle turbinate bisects the nasal cavity, the lower border of which is the floor of the nose; the superior the cribriform plate. Remembering this, one may have greater latitude in his operative procedures.

Detached spicules of bone or cartilage lodged crosswise between the mucous membrane, frequently give greater deformity with corresponding symptoms than the original condition from which the patient suffered.

To remove the perpendicular plate of the ethmoid bone we use a Hajek chisel and incline it at such an angle to take the part parallel with the nasal bone leaving only a thin piece, then removing the bone with a pair of Luc forceps.

Perforations are not considered serious other than the prolongation of the convalescence. We all have them more or less and in

spite of all care they will occur when we least expect them; when they do occur, if they are small and pinpoint they are apt to cause an annoying whistle, if large, cause crust formation, especially if a small piece of bone or cartilage is exposed to the air, and this in turn will prolong convalescence until the offending material is cut off and the mucous membrane is allowed to heal.

If a large area of mucous membrane is denuded on one side there will be crusting for a considerable length of time with occasional hemorrhage and considerable nasal irritation.

The amount of bone to be removed, especially if the deviation is high up, can always be determined at the time of operation: when, however, a portion of the perpendicular plate has been left, it can be removed by performing a secondary operation, but due to the previous trauma this is usually a very difficult proceeding and if there has been a perforation, it makes the operation doubly difficult.

In performing the secondary operation we have to contend with the fibrous tissue formation and it is always a question where to start.

The incision is usually made high up on the bone that we wish to remove and at right angles to the external surface of the nose; then another incision is made at right angles to the first, this gives a T-shaped flap. It is now a simple matter to dissect up the mucous membrane first on one side then work downward and beneath the bone to the other side without the danger of a perforation. When both sides are dissected up the removal of the bone is carried on as in the ordinary sub-mucus resection of the septum.

312-314 Otis Building.

Acute Suppurative Whartonitis. LEVY DU PAN, *Rev. Med. de la Suisse Romande,* Nov.-Dec., 1916.

The patient, a woman of 48, complained of severe pain and swelling in the right submaxillary region, difficulty in opening the mouth, salivation and immobility of the tongue. Examination showed a calculus in Wharton's duct which when extracted was found to be 1.5 cm. long and 2 mm. thick. It had a slight longitudinal groove so that the duct had not been completely blocked. Removal of the calculus was followed by the escape of thick pus. ED.

SOCIETY PROCEEDINGS.

NEW YORK ACADEMY OF MEDICINE.

SECTION ON LARYNGOLOGY AND RHINOLOGY.

Regular Meeting, October 24, 1917.

A Case of Peroral Removal of Tack From Lung of Child; X-ray and Specimen. DR. HENRY H. FORBES.

Eugene D., aged seven years, was admitted to the Post-Graduate Hospital, July 6, 1917, with a history of foreign body in the lung, as shown by the X-ray. The history dated back some six months, at which time the child had inhaled an upholsterer's tack (specimen presented). Three months later the child was operated upon for a right-sided empyema, and the drainage button was still in place when the child was admitted to the hospital. There was an excessive and very foul discharge from the chest; the child was emaciated and was running a septic temperature. Leucocyte count, 20,700; polynuclears, 78 per cent. Culture from the discharge showed staphylococcus and colon bacillus.

The first examination showed a stricture of the bronchus. No foreign body was seen. Time, about twenty minutes.

Second examination: X-ray, dilated stricture. No foreign body seen. Time, twelve minutes.

Third examination: with combined X-ray, more dilation, and attempted cutting. Tip was seen and grasped. Time, fifteen to twenty minutes. Dr. T. J. Harris present.

Fourth examination: Dr. Lynah present and assisting. More dilation and attempted traction, but still felt resistance. Time, probably twenty to twenty-five minutes.

Fifth examination. Instrument failed. Time, about one minute.

Sixth examination: Dr Lynah present and assisting. This time Dr. Lynah urged pulling hard According to the suggestions of Dr. Lynah the axis of the instrument was perfect and the point of the tack was fully within the opening of the bronchoscope, and it was removed. Not so much traction employed as on the third attempt, when Dr. Harris was present and as much traction was employed as was felt to be safe.

During the time in the hospital, the child had been under the care of Dr. Peterson for empyema, and he felt that it was much safer for the work to be done by the tube than to attempt to go in through the chest wall. It is interesting to note that irrigation of the chest prior to the removal of the tack caused no trouble, but that irrigation the day after removal caused great distress, the fluid entering the bronchus and trachea. The child left the hospital on September 12th, much improved in general health. He has since returned to the hospital, and is under Dr. Peterson's care.

This was a very interesting case and was presented for the reason that it demonstrated clearly some of the postulates of Dr. Jackson:

bronchoscopy is gentleness (several men present at various examinations urged the use of more force). It is dangerous to pull on a tack until the point is in the mouth of the tube and one can use axis traction; also, to pull until it is dislodged and free is to invite disaster.

(Dr. Forbes presented an X-ray illustrating the presence of the tack, and the condition of the lung with reference to the abscess—the drainage button also being seen—and expressed his indebtedness to Dr. Meyer of the Post-Graduate Hospital in taking the radiographs and for advice and assistance in the manipulation of the flouroscope at the time of the attempts at removal, and said that he feels the X-ray is of great assistance in many cases.)

Lung Abscess Following Inhalation of Foreign Body. X-ray and Specimens. DR. HENRY H. FORBES.

Mrs. M., age 39, was admitted to the Post-Graduate Hospital on August 27, 1917, having been referred by Dr. Erdmann, with the history that sixteen months previously, while in excellent health, she had had a number of teeth removed under general anesthesia. A few weeks thereafter, she developed a constant cough accompanied by profuse purulent expectoration. She lost in all some sixty-eight pounds. About five weeks prior to admission to the hospital she had coughed up a piece of bone. Up to that time a diagnosis of purulent bronchitis had been made. No tubercle bacilli being found in sputum. X-ray picture showed an abscess cavity in lower upper left lobe, but no foreign body.

X-ray taken at the hospital showed the same condition. Bronchoscopy has been performed eleven times; local anesthesia; No. 9 Jackson tube, suction tip to opening of abscess cavity, followed by injection of one dram of 15 per cent. argyrol solution, again passing suction tube to remove excess. (Dr. Lynah assisting). The quickest time noted for this work were three and a half minutes, and seven minutes—from use of laryngoscope to removal of bronchoscope. There was no need for haste after the second treatment. The patient had been brought to the hospital on a stretcher and had been told that she had not a week to live unless something was done.

Amount of fluid brought up at time of admission was one pint. Pieces of bone and tooth were coughed up by the patient. The X-ray pictures were interesting and instructive. The first picture failed to show a foreign body, and yet later the tooth was coughed up by the patient; it showed beautifully the abscess cavity and the level of the fluid. The second showed three areas; one of these had disappeared in the third picture, which showed the presence of two distinct foreign bodies.

The pictures were taken by Dr. Meyer of the Post-Graduate Hospital, who had been deeply interested in watching the progress of the case.

DISCUSSION.

DR. LE WALD, inquired in regard to the empyema operation. As he understood it, the tack was removed through the bronchoscope, but prior to that the child had been operated upon for supposed empyema, which complicated the condition. In the light of subsequent events, that operation seemed to have been unnecessary. It would be interesting to know whether the empyema operation was done prior to X-ray exami-

nation and location of the tack. He and Dr. Nathan Green had a similar case in which an operation had been done for a *supposed* empyema without an X-ray examination having been made. A few weeks later, the child not being better, an X-ray examination was made and at once revealed the presence of an unsuspected upholsterer's tack in the bronchus. The tack was removed through the bronchoscope, but the previous *unnecessary* empyema operation wound left a fistula which was still open a year later.

DR. HURD said that he had not heard Dr. Forbes state how the tooth got down in the lung after the tooth was removed under general anesthesia.

DR. N. S. JARVIS, in connection with the presentation of Dr. Forbes' case, told of how he had been permitted to leave a dentist's chair with a tooth in his lungs; that it remained in his lung for five days and was then expelled, together with a small fragment, by a violent attack of coughing.

DR. HARRIS said that the second case was one of the most interesting he had ever known. Dr. Forbes had reported it so fully and drawn the conclusions so clearly that little could be added. It certainly bore out the claims made by Dr. Chevalier Jackson. The profession has been fighting Dr. Jackson pretty hard on the question of general anesthesia; but if those present knew of the little trouble experienced with this child they would certainly agree with Dr. Jackson. It was perfectly marvelous to see the condition of the child after operation without any anesthesia at all. When Dr. Jackson has taken his position after so many years of experience, he is entitled to respect. Dr. Harris said that such a case as this had made him feel that Dr. Jackson was right, and he wanted to go on record accordingly.

DR. LYNAH said that he had had the pleasure of working with Dr. Forbes on both of the cases reported by him. In the first case the one with the upholsterer's tack, presented the problem of the "mushroom anchor" which Dr. Jackson had so often called attention to. The tack was in the right stem bronchus with the point presenting to the left and held in a firm stricture of long standing. The stricture was dilated with forceps but the tack when grasped with the tube in the axis of the bronchus was immovable, and only reanchored itself under the stricture in the bronchial wall. The tack was not removed until axis traction was employed. With the 7 mm. Jackson tube in situ the head and body were rotated well to the left until the lip of the bronchoscope was on a line with the axis of the presenting point of the tack, and not on a line with the axis of the bronchus. The shaft of the tack was grasped with the alligator forceps and removed, the bronchoscope being removed at the same time.

The other case, that of a woman with an abscess of the lung and suspected foreign body was also bronchoscoped, and a quantity of pus removed from the left superior lobe bronchus. Dr. Forbes had the patient X-rayed immediately after the evacuation of the pus but no foreign body was seen. Whether the X-ray would penetrate a tooth or not that was in the lung he could not say, but he thought a shadow should have been visible. He then cited a case reported by Dr. Jackson of a woman with

a collar button in her lung that lay in a bed of pus for years which was not visible by the X-ray picture, and was only located after thoracotomy had drained the cavity of the empyema, when he removed the button by peroral bronchoscopy. As the pus was pouring out of the left superior lobe bronchus no doubt it was well in the bronchus and had it been located by the X-ray examination would have been difficult to reach in this locality. "I did not see the patient after this examination but Dr. Forbes informed me later that a piece of a tooth had been coughed up after repeated washings of the bronchus and that she made a perfect recovery."

DR. YANKAUER said that an upholster's tack was a particularly difficult foreign body to remove, because of the tendency of the point to burrow itself in the wall. Two years ago he had presented before the Section a tack of this kind which he had removed from a child's bronchus, and had then demonstrated an instrument which he had devised for the purpose of freeing the point of the tack.

In regard to the other case Dr. Yankauer said that he had removed several pieces of bone from the bronchi in cases of bronchiectasis, and in none of the cases did the bones show in the radiograph. This was rather surprising, because bones show so distinctly through ordinary flesh; but when embedded in the tissues of the lung cavity they very rarely show. In the same way, vegetable and animal substances are very apt to be missed in the radiograph. He had presented before the Section a piece of chicken bone removed from a lung abscess, which had not shown in the radiograph; he had also presented several pieces of bone that had not been seen, in cases where the picture was very similar to that shown by Dr. Forbes. About six months ago he removed a snail shell from the right bronchus which had been there for 15 years. The patient had a lung abscess, but showed no shadow until recently, when another X-ray was taken which showed a slight shadow; it was very indistinct, but it suggested a foreign body—then the history of inhalation was obtained, and the foreign body was removed. It is possible that with the improvements in radiography some of these foreign bodies will be found that now escape observation. There are many foreign body cases in which the history has been lost or forgotten, and then a lung abscess develops and the radiographer makes a diagnosis of abscess but not seeing the shadow of a foreign body does not make that diagnosis. Dr. Forbes was to be congratulated on his success in these cases.

Endolaryngeal Removal of Malignant Growth; No Recurrence at End of Over Eighteen Months. DR. HARMON SMITH.

Mrs. G. H. R., age 45, consulted me early in May, 1916. At this time she claimed to have been hoarse for over three years. Had experienced slight pain on swallowing, and had been treated by her doctor with sprays and local applications, who had informed her that she was suffering from a chronic laryngitis. For a few months previous to coming under my observation she had given up treatment, as no improvement had been noted. Her weight had remained the same and her general health had not been affected except by the loss of sleep, due to a sense of suffocation when in a recumbent position.

Upon examination there appeared a large, single pedunculated papillomatous growth, attached to the anterior part of the right cord and extending slightly beneath the cord in the anterior commissure. On inspiration it would fall between the cords and on forceful expiration would rise above them. Believing the growth to be benign I removed it without difficulty under cocain, employing the indirect method. Considering the length of time she had been hoarse and the appearance of the cord after removal, I decided to have it examined microscopically. Our pathologist at the Manhattan Eye, Ear and Throat Hospital, Dr. J. G. Dwyer, made the first examination and reported as follows: "At first sight this specimen would appear to be a simple papilloma, but there is no doubt that it is a carcinoma, probably of a low grade of malignancy. The transition in cell structure is quite marked."

Not being willing to abide by one opinion in this matter, I requested Dr. Dwyer to send the sections to Dr. Ewing, who reported as follows: "Your section of laryngeal tumor is highly interesting. It seems to show better than any I have ever seen the principle that some carcinomas are papillary in architecture. Histologically this tumor is malignant, while still largely papillary. The malignant signs appear in many foci of infiltration of the stroma by cell nests and more particularly in the markedly atypical changes in the thick lining of the epithelium. I wonder whether the history suggests a malignant change in a formerly benign papilloma?"

From these two reports I felt it my duty to notify the daughter of the patient, who is in training as a nurse in the German Hospital, that the prognosis was extremely grave and that to take advantage of the condition at its most opportune time, it would be necessary to do a thyrotomy and remove the cord and mucous membranes of the right side of the larynx. As all of the family were working people and the daughter was being educated as a trained nurse in order to help support herself and other members of the family, it was deemed absolutely impossible to have an operation performed on the mother, as it would necessitate the daughter giving up her work in the hospital.

I then presented the question to the patient, who said that she would take the chances of delay until the graduation of her daughter as a nurse. Since that time, May, 1916, I have seen the patient on an average of once every two weeks and have treated the larynx with a weak solution of nitrate of silver. There has been no return of the growth, the cord has become more flexible and the redness has largely disappeared, though at times it appears more red than at others. Her voice has been restored to what she claims to be as good as before the operation. She has gained in spirits, her health is perfect, sleep is normal and so far as my observation can determine, there are no untoward symptoms, or evidences of recurrence.

Of course had I known that this tumor was malignant, however low grade in character, I would not have removed it, except by more radical measures. It merely demonstrates, what I have so often claimed, that the microscope does not evidence the degree of malignancy of a tumor. There have been several cancers of the larynx removed indirectly, where there has been no recurrence for a long period. One was reported by

Sir St Clair Thompson, in the Transactions of the American Laryngological Association, 1914, where the tumor was removed inadvertently in an attempt to obtain a specimen for microscopical examination. Dr. Lynch, of New Orleans, has removed four cancers of the larynx under suspension laryngoscopy with success. (Transactions Am. Laryngological Association, 1915.) Berens reported a similar case by the indirect method in *The Laryngoscope*, Oct. 1910.

DISCUSSION.

DR. MACKENTY said that there was no doubt that some of the cures reported after laryngectomies are due to the fact that the cases were of low malignancy. He has seen, while in general surgery, a case of melanotic sarcoma after general dissemination hold up for five years before producing death by activity in the liver.

DR. HURD said that Dr. Smith had brough up the point that the histologist cannot tell how malignant a growth may be. He then cited the case of a man with a lesion of the larynx for over seven years; at the same time a woman presented herself with a lesion of the sphenopalatal fissure, and under the microscope one could not distinguish the specimens apart. The man had had the condition for seven years and went on quite a while before he choked up and required a laryngectomy. The woman had had her trouble only six months and died soon after, yet histologically there was no difference in the specimens.

DR. FAULKNER recalled a remark made by Dr. Jonathan Wright, who said that malignancy was a question of molecular dynamics. It was found in a great many other places apart from the larynx, that a growth with all the appearance of an innocent structure took on malignancy later on. The basic structure may not be papilloma or odenoma. Some rectal growths which have the gross appearance of an innocent growth under the microscope may show signs of malignancy. In some cases he has examined the whole of a breast, cutting twenty or more specimens, and finding only one with signs of malignancy. That could scarcely be called a malignant tumor. Where the physical appearance of the basic structure is decidedly papillomatous or adenomatous, one is quite justified in local removal, then watching the case, as Dr. Smith had done in this instance.

DR. HARRIS said he wished to emphasize a point that had already been made—namely, that one cannot justly and properly rely upon the microscopic findings alone. In this connection he always thought of the late Dr. Gruening who was the dean of the otological profession of this city up to the time of his death. Dr. Gruening believed in all the new methods, but continually emphasized the fact that one should not allow them to supplant our clinical knowledge and findings. That is absolutely true. We are too much inclined to look upon what the pathologist says as the thing to go by. Dr. Jonathan Wright also emphasizes the fact that the clinical findings and the pathological findings together should be taken as a guide to procedure.

Dr. Harris said he was glad that Dr. Smith has again pointed out what should be the guiding principle in an important problem which presents itself, especially in private work.

DR. MCCOY said that in connection with this case one should remember the rule laid down as a guide in the diagnosis of malignant tumors, i. e.,

that the malignant tumor is one that infiltrates the surrounding tissues. That was the rule he mainly relies on in making the diagnosis of malignancy. Here is a growth which has existed for three years and has shown no tendency to infiltrate the surrounding tissue; and when removed by the snare operation the tissue itself shows malignant tendency. He therefore considers this a clinically benign tumor.

On the other hand, we have growths removed which do not reveal malignancy under the microscope, and yet later prove to be very malignant. He considers Dr. Smith's course therefore a perfectly correct one, that is, to shave off the tumor and watch it. Shall we then advise our patients to have such an operation performed? It would seem to be unwise in a case of infiltrating malignancy that there should be any temporizing with the growth in this manner. Dr. Smith's case was one which was located well anteriorily, on the cord. That type of case particularly lends itself to intra-laryngeal removal, for the lymphatics do not cross anteriorily, the lymphatics on the cord are practically nil, and the tendency to spread and infiltrate the surrounding tissue is less—so that a tumor at this site offers the most favorable site for intra-laryngeal removal. If it infiltrates the arytenoid, it is a dangerous procedure. Semon in his description of thyrotomy says that he limits them to those cases that involve the false or true cord not too far back. When a patient presents himself with a tumor of this kind, we should consider the location. If it is well forward, and if the tumor is small, one might with propriety advise intra-laryngeal removal, such as has been reported. With the improvement in suspension laryngoscopy one can almost as easily remove a small infiltrating cancer, as by splitting the cartilage externally, i e., thyrotomy.

Dr. Smith, in closing the discussion, said that if, previous to operating, he had known the tumor to be malignant, he would never have attempted to remove it intra-laryngeally; but that believing it to be merely a papilloma he removed it to relieve the dyspnea. After determining that it really was malignant, he put the question up to the family and they declined to have the major operation, so that he watched it with more or less anxiety. Thus far there had been no sign of recurrence, and the patient's voice was as good as ever. Outside of the slight abrasion at the point of removal, there were no unfavorable signs.

Dr. Smith said he understood from what Dr. Ewing had stated that in some cases a papilloma could become malignant. Those who have had experience with children know that in some cases papillomata will recur with great exuberance, while in others they will not. If he had known this case to be malignant, he would have done a suspension laryngotomy, with removal of the interior of one side of the larynx; but believing it to be papilloma, just as St. Clair Thompson had inadvertantly removed the growth in his case, he had removed it by the indirect method. He would not, however, advise the indirect method of operating in any case of recognized malignancy of the larynx.

Result of a Laryngectomy. DR. LEE MAIDMENT HURD.

DR HURD showed a specimen which he had presented before the Section last June, but was presented again as the case had a bearing on this question of benignity and malignancy. In October, 1913, the pa-

tient presented himself with what appeared to be a mucous polyp in the anterior commissure. It was removed and nothing more was thought of it. In May, 1914, he presented himself again with a growth near the anterior commissure on the right cord, the size of a pea. This also was removed, but no record was kept of its character, as it was thought to be only a common papilloma. In September, 1914, the man returned again with another papilloma in the same situation, and then Dr. Hurd tried to persuade the man to return and have the base of the growth treated in the hope of stopping its recurrence, but he would not. Last April (1917), three years after the latest removal, he again presented himself, this time with an extensive infiltration of the larynx—no doubt a malignant growth. He stated that he had been to Dr. T. Smith in Hartford, to have radium applied; then he saw Dr. Coakley in consultation; and Dr. Coakley told Dr. Hurd that he had seen the patient in 1913, before he applied to Dr. Hurd for treatment, and had at that time pronounced the growth to be a papilloma. Evidently the growth went back five or six years, and all that time up to the last it showed all the appearance of a benign growth

On April 24, 1917, a low tracheotomy was performed. From the time of operation to May 9, the intervening period was occupied in removing a number of stumps and very foul teeth and in getting the mouth as clean as possible. On May 9, a laryngectomy was performed under local anesthesia until the trachea was reached, when a little chloroform was administered. The man's neck was very thick, and his larynx was very large. The operation was extended to the sterno-cleido muscles for glands, and these were cleaned out on both sides. The infiltration of the trachea extended down two rings, and these were taken out. A tracheotomy tube was put in and the wound sewed up, but it broke down, and the man had a sharp reaction for four days, but finally got well. The entire wound sloughed and there was a great mass of granulations. It gradually filled up, leaving an opening a half inch into the esophagus. This was closed by a plastic operation, and subsequently two other plastics were performed, both of which failed. The patient had not been seen since last July.

The tube has now worked up to above where the opening was. Evidently the skin about the tube is soft and it has slid up. There is now a fistulous opening just above the trachea, running up into the esophagus; and when he tries to eat the food runs down. Up to a few weeks ago he wrote that he was doing finely; but then suddenly developed a swelling in his neck, and to-day foul, sloughy material was removed. He has evidently infected the tissues o fthe neck, but nothing could be feit to indicate recurrence in the neck Dr. Hurd said that he had the patient under treatment for the purpose of cleaning up the pharyngeal fistula, and felt hopeful of succeeding. The man made no effort to talk, and evidently thought that his voice would come back of itself.

Result of Removal of the Tonsil. Dr. L. M. Hurd.

This patient presented himself last spring with a large growth of the tonsil extending well up to the soft palate down to the level of the larynx. Dr. Hurd said that contrary to the statements of the text-books, neither this case nor one of carcinoma which he had seen recently had any pain

The only symptom which this man complained of was a sense of fulness in the throat. The growth did not extend outside the tonsil, and there were no glands in the neck. The case was operated upon in July, the neck being opened and the external carotid tied. Ten enlarged glands were found and cleaned out. The throat was dry so far as blood was concerned, and the growth was removed with the finger—starting the cleavage with the tonsil dissector and then enucleating the growth. The operation was performed under rectal anesthesia. At first there was some trouble, for as soon as the throat relaxed the patient choked up. After that the growth was held out of the way. When seen ten days ago his throat was entirely well, but there was a recurrence in the glands down behind the sterno-cleido mastoid muscles, and the man cannot get his arm above his head. He declined subsequent operation.

DISCUSSION.

DR. MACKENTY said that Dr. Hurd had spoken of some method by which the wound could be closed above. In looking at the case, it had occurred to him that the following procedure might be effective: A considerable portion of the man's trachea was still palpable, and it might be possible to do a low tracheotomy and feed him through the neck wound with a tube in the esophagus. That would rest the condition, and the wound would take on a healthy action. It might then be possible to succeed with a plastic operation. Dr. MacKenty said that in his experience one can never succeed with a plastic operation where there is any infection.

DR. SMITH, referring to the case of sarcoma of the tonsil, said that he had several cases of sarcoma of the tonsil, and that they could be successfully removed so that there would be no recurrence at the point of removal. In one of his cases he had removed the growth on one side and it recurred on the other. In another, the sarcoma did not recur in either location, but the patient developed a sarcoma of the mediastinum, but died of sarcoma of the brain.

DR. MCCOY said that a growth which extends to the second ring of the larynx is usually regarded as an inoperable case, for the glandular drainage is into the mediastinum, and there will almost invariably be a recurrence in the mediastinum.

Referring to the case of sarcoma, he inquired whether Dr. Hurd had applied radium to the wound after the operation. That might have some influence in preventing a recurrence.

DR. HURD, replying to Dr. McCoy, said that the recurrence was in the glands. All were drained.

DR. MCCOY said that it would be interesting to know what would have happened had radium been applied.

DR. HURD said he was glad to know of Dr. MacKenty's suggestion. The tube was filled up, and filled the pharyngeal and laryngeal openings, so that they are now one. The tube was quite low at one time. He had not thought of the tracheotomy lower down. The man's neck was very thick.

As to the question of sarcoma removal; several cases had interested him. It does not recur at the site of removal. This man's growth did not recur at the site of the wound, but way down in the neck. In one

instance he had removed a growth just below the cord in the larynx; and the growth reappeared in the antrum.

Case of Tuberculous Laryngitis Mistaken for Carcinoma. DR. WOLFF FREUDENTHAL.

The patient, 59 years old, was a man whose nose had been operated upon on the right side, two years ago; a little later the left side was operated upon. A severe hemorrhage followed which lasted for a few days; after that he felt better for a little while. Then he began to be hoarse, and has remained so for about a year and a half. He came under Dr. Freudenthal's care with a diagnosis of malignant neoplasm, that had been made by several laryngologists. He presented the following picture in his larynx: There was an edematous swelling and a marked perichondritis of the right side and considerable swelling on the left side. The right ventricular band showed an irregular mass which resembled very much malignancy and had been taken as such. Considering the whole aspect of the case, however, Dr. Freudenthal took it to be of tuberculous origin. Wasserman reaction was negative; no tubercle bacilli were found, and the lungs also were negative.

In spite of all this, he still felt that it was one of those cases which are seen from time to time, presenting a tuberculous affection of the larynx without visible signs elsewhere. The patient was treated throughout the winter on that basis. At one time an ulceration developed, and a little later during the cold weather the perichondritis became so marked that dyspenea set in and a tracheotomy was immenent. But to this the patient was opposed, and his condition improved so much that no tracheotomy was necessary.

Dr. Freudenthal said that at first he hesitated to take a specimen for examination, in view of the fact that several men had pronounced it a case of malignancy, but later relying on his own conviction he removed a specimen upon which he would report later.

In the meanwhile ulceration appeared on the right side and a paralysis of the right recurrent developed, which is still present. Later, the patient was sent to the country and for a while he was much better, but then a dry pleurisy developed, first on one side and then on the other. That seemed to Dr. Freudenthal a positive indication of tuberculous affection, in spite of the absence of tubercle bacilli. The condition did not seem to bother the man, and he continues about his business, which is that of a ticket shaver in a theatre. The air there is not the best, but the man spends much of his time in the country.

The specimens removed were seen by Dr. Globus and by Dr. R. A. Lambert, and both agree that they show chronic inflammatory process, with some ulcerative process going on. Dr. Lambert was inclined to consider it a tuberculous condition, while Dr. Globus was inclined to consider it specific, but neither would give positive diagnosis.

Dr. Freudenthal said, however, that this was a case in which one has to rely upon his own clinical experience. In many instances the microscope will not give any definite evidence while one's clinical experience indicates whether or not it is malignancy. The whole course of the sickness proves it to be of a tuberculous nature.

The man's nose had been operated upon, and he asked Dr. Freudenthal if Dr. So and So had not taken too much out of his nose. He made an evasive reply, but was inclined to feel that the patient might be right. Many of the younger men of the profession seem to feel that it is necessary to have a mathematically straight septum. Dr. Freudenthal said he was convinced that in many instances these operations are detrimental to the patient; too much of the mucous membrane is removed, and what remains cannot work normally any longer. Or an atrophic process sets in, which is still worse.

DISCUSSION.

DR. HARRIS said that Dr. Freudenthal was strictly correct in his statement as to the existence of a clinical tubercular condition of the larynx which it is not possible to confirm by the findings of the chest. They had been following such a case at the Post-Graduate Hospital for two years, and the man finally did show signs in the chest. He had had an indolent inactive process in the larynx, chiefly new growth; yet repeated sections and microscopic examinations gave no conclusive findings. Finally after a year and a half the diagnosis was cleared up, the larynx taking an active process. The epiglottis was removed and microscopic examination showed tuberculosis, and at that time there were found signs in the chest.

DR. EMIL MAYER said that there are certainly a number of intralaryngeal infiltrations that are puzzling.

He recalled in this connection a patient whom he had recently seen who had been under the care of one of his colleagues in a distant state, and where there was much infiltration, certainly a perichondritis and where the question fairly arose as to the nature of this infiltration, and whether steps should be taken to remove a portion for microscopic examination. In view of the fact that such attempts at removal may occasion a stimulation of a malignant disease, the speaker thought that one should be most careful before advising the removal of the growth which after all was occasioning very few symptoms, hence in the case cited the advice was given to do nothing.

The possibility of scleroma in the case of Dr. Freudenthal's patient was borne in mind, but the man says that he comes from Roumania, which is far enough away from the original site of scleroma, in Posen. Hence scleroma would not be considered.

The speaker had some hesitancy in calling this condition tuberculosis from the picture presented, and he felt that we should be careful about making such a diagnosis when the known facts of tuberculosis were not present, for this disease has positive landmarks.

It is true that the patient may ultimately develop tuberculosis, but that is another story.

We are chiefly concerned with the question as to what we would tell the patient or his friends was the diseased condition here presenting, and the speaker felt that the most that he could say was that there was a suspicion of tuberculosis.

Dr. Freudenthal said that the case referred to by Dr. Harris confirmed his opinion, in regard to this class of cases. What Dr. Mayer had said may be correct from his point of view, but he could not agree with him.

The patient has a dry pleurisy, and has had it for six or eight months. That was some sign of tuberculosis, and he believed that within a year or so the man would show more signs. He had treated him for two years and so far no symptoms of carcinoma had developed.

Dr. Mayer is right that Roumania is far away from Posen. But Posen is not the "original site of scleroma." Probably the Doctor meant Galicia, which would be more likely.

Specific Perforation of the Palate; Presented for Opinion in Regard to Proper Course of Procedure. DR. THOMAS J. HARRIS.

The patient was a little boy, with a history of congenital syphilis. It was one of those obstinate cases which had to be fought by repeated injections of salvarsan together with plenty of mercury and iodide in order to conquer the disease in the nose and throat. The blood became negative last August. The condition in the nose in now inactive, and the throat had been thought to be inactive, but a small ulceration had just been detected. Otherwise the child was in excellent condition.

The problem now presenting itself was whether anything could be done to help him further. Unless something unusual could be done, the shutting up of the hole to help his voice would cut off his breathing space; for the amount of cicatricial tissue present would seem to make any such attempt to use it foredoomed to failure, and it would be better not to undertake it rather than to go on and not succeed.

Dr. Harris said he would appreciate any expression of opinion as to what would be the wisest course to pursue.

DISCUSSION.

DR. EMIL MAYER said that the case was a very interesting one and one in which a great deal could be done, by the exercise of patience. He would not advise any cutting procedure at present, but would suggest a very constant dilatation. Some years ago he had a case with a practically similar cicatrization and adhesions, with only a very small opening. He got the instrument maker to make a few graded bougies of hard rubber, almost rectangular, and of the proper length, and he instructed the patient how to introduce these each day, keeping them in a certain length of time—practically practicing divulsion such as is employed in urethral strictures. No harm can be done by such method, and a much larger opening will result. The dilatation is done with practically no discomfort. A more forcible dilatation could be done by the old Lowenberg post-nasal forceps by the physician from time to time, and when the child could be gotten to a condition where there was no active process, one might think of further surgical procedure. He believed, however, that such dilatation as he has described would do a great deal of good.

DR. FORBES said he believed Dr. Harris would bear him out in saying that in another case where there was a luetic condition Dr. Pisek had advised him, much to his surprise that even after medication in these children he was very rarely able to clear them up and get a negative Wasserman. Dr. Pisek said that he would not hesitate to do operative work on the case because of the fact that he gave a positive Wassermann. Dr. Forbes said he would like to know whether the members of the section agreed with this statement that it was only rarely that one got a negative Wassermann in these cases of inherited luetic conditions.

DR. ABRAHAM said that he was impressed by the presence of what he considered an active process. There seemed to be some infiltration and ulceration, and he had been much interested by the condition. Ten years ago he had operated on a case and presented the patient before the section, in which it had been impossible to pass a filiform bougie from the mouth to the pharynx.

At present he would not advise dilatation in this case. When he was a student in Vienna, Dr. Stoerk showed a number of syphilitic conditions which had been treated by this method, some of them for a number of years. No great result was apparent excepting while the dilatation was going on. The cases in which the treatment has been discontinued would still show the cicatricial tissue.

In the case which he had undertaken to operate, he had used a curved flap of adhering mucous membrane on the pharyngeal wall, dissecting it away, sewing, putting in stitches and allowing it to heal. At first two fingers could pass, but later on, after following it for several years, the space shrank until it was only as large as the little finger. He had wanted to make further efforts to relieve the condition, but the woman refused, for she could breath through this opening.

A second case on which he had operated gave about the same history. This, of course, refered to operation on syphilitic cases. Dr. MacKenty had operated on some cases, but Dr. Abraham did not know whether or not they were syphilitic.

DR. MACKENTY replied that one of them was syphilitic. The patient had a large pharynx, and has now a good large pharynx. That was seven or eight years ago.

DR. ABRAHAM said that he had followed the cases he had operated upon for several years. At present he would not advise dilatation on this case.

DR. HARRIS: "Disregarding the fact that the active process might not be entirely ended, what would Dr. Abraham suggest after that had cleared up?"

DR. ABRAHAM replied that he would try eversion of the cicatricial tissue and suturing the perforation. In this work he had found a method of anesthesia a great aid—cocain locally and hyoscine hypodermically. It is remarkable what a dry pharynx one gets by this method during the whole operative procedure. Inject 1/100 grain of hyoscine hydrobromid a half to three-quarters of an hour before operating.

DR. MAYER wished to know—aside from the fact that Dr. Abraham did not believe in dilatation—what harm there would be in using it to give a larger space when the time comes for operation.

DR. ABRAHAM replied that he thought that remains of the soft palate were still adhering to the post-pharyngeal wall. The perforation was in the soft palate, and to dilate this would only produce a larger perforation. His ideal was to try to close the perforation and avert the flap of scar tissue and mucous membrane. Unfortunately, scar tissue is so poorly supplied with blood vessels that in this case he would hesitate. In fact, he would prefer observing the case for a time before deciding on a procedure.

DR. MCCOY said that he had a case of perforation of the hard palate in an adult. He cut off two-thirds of the attached inferior turbinate, then

jammed it down in the perforation. The patient talks very well now, while before the operation he spoke very nasally.

DR. ABRAHAM said that in the first case he operated on he had used the dilators for a length of time.

DR. HARRIS said that he had presented the case in the hope of getting some valuable suggestions, and these he had received. He had not seen the patient for some time, and had not seen the evidence of the active condition. He was not at all clear as to whether or not any operation was advisable. Those who had examined the case carefully would recognize that it was not of the usual type. There was not a complete shutting off of the nasal pharynx, and the boy breathes almost perfectly. The perforation was an unusual one, and it would be a great injury to the child to shut off his breathing, even to secure better speech. The surrounding tissue was very dense. It was his own opinion that any attempt to throw up a flap from that tissue would be unsuccessful. So far as doing the one thing that seemed indicated, his own feeling was that it was better to let matters alone. He would try to present the case later and perhaps then would ask for further suggestions.

Case for Diagnosis and Suggestions as to Treatment. DR. W. M. HUNT.

The patient was a U. S. Marine, age 21, born in Italy. Has been seven years in the United States. Has always been healthy excepting for children's diseases. Nose and throat negative except for a pair of enlarged tonsils and slight deviation of the nasal septum to the right. Eyes: Vision, O. D., 20/40; O. S. 20/30. Ophthalmoscopic examination, negative. About two months ago he first noticed a growth at the inner upper angle of the right orbit, which has greatly increased in size. It has been slightly tender upon pressure. No pains or headaches, or other inconveniences, or history of injury. Tumor is firm and immovable. Wassermann negative.

X-ray report as follows: Mass about size of a walnut on the right side, encroaching on the lower part of right frontal sinus, lower median side of the right orbit, and the right ethmoid region, crossing the midline into the left ethmoid region for about a quarter of an inch. Probably benign; most likely fibrous or cystic.

The patient has been selling Liberty bonds on the street and has a little cold in his eyes. This accounts for the redness. He is beginning to see double. There are no indications of ethmoidal trouble.

DISCUSSION.

DR. MACKENETY said he thought it might be a case of mucocele of ethmoid and that the removal of the sac would cure the condition

DR. EMIL MAYER suggested that the removal be done with an incision through the eyebrows, extending downward over the growth. There seemed to be a periosteal tenderness for the man winced when it was touched, and there might be a good deal of pressure behind, for there was a good deal of loss of vision compared with what he had before. By operating as he had suggested, the tumor might be removed with a minimum of scar tissue.

DR. FORBES agreed with Dr. Mayer.

MAJOR LÆ WALD said that the case presented an interesting problem as to the cause of the condition. The question of Army insurance liabil-

ities is now very much to the front, and he himself was not convinced that the man had as much pain as he seemed to have. There were also to be considered the questions as to his refusing operation, and whether or not the condition existed at the time he enlisted. The density of the lesion almost made him think of osteoma—though there was nothing yet to base this upon except the consistency. One has to be very cautious in deciding as to the duration of a process in presenting a patient's claims in a case of this sort. The fact that the man claims to have diminished vision at this time should be considered very carefully before one can accept his mere statement.

DR. C. E. WEBER said the mere fact that the patient claimed a diminished vision, the growth being anterior to the optic disc, proved that the lesion is of long standing, for there would be no marked loss of vision in that time without any ophthalmoscopic showing.

DR. MCCOY said that last spring he had presented before the Section a young girl with a cystocele. Usually in these cases one can detect areas of light and shade in the X-ray plate. Before operation this girl had a vision of 20/200 and to-day it is 20/30. She had a very decided diminution of vision, due entirely to the tumor.

DR. HUNT thanked the members for their suggestions. He had presented the case for the purpose of obtaining opinions as to the probable origin of the condition and probable duration, since it was very necessary that malingering be excluded, as the man might not be fit for service again, and the question of Government liability and pension was an important one.

War Injuries of the Ear: A Resume of Recent Literature. J. S. FRASER, *Edinburgh Med. Jour.*, Feb., 1917.

This paper contains a useful and interesting digest of the subject. There has been considerable divergence of opinion on the question of operation in cases of direct injury to the middle-ear or labyrinth when the x-rays reveal the presence of a bullet or a piece of shell. The best course appears to be to wait, if the wound be recent and aseptic, but to operate at once if otorrhea be present, and especially if there are facial paralysis, labyrinthine disturbance, or meningitis. The principal features of functional loss of hearing which distinguish it from that due to labyrinth concussion are the absolute deafness; total loss of hearing for tuning-fork both by air and bone-conduction; retention of the patient's normal tone of voice; absence of spontaneous nystagmus. GUTHRIE.